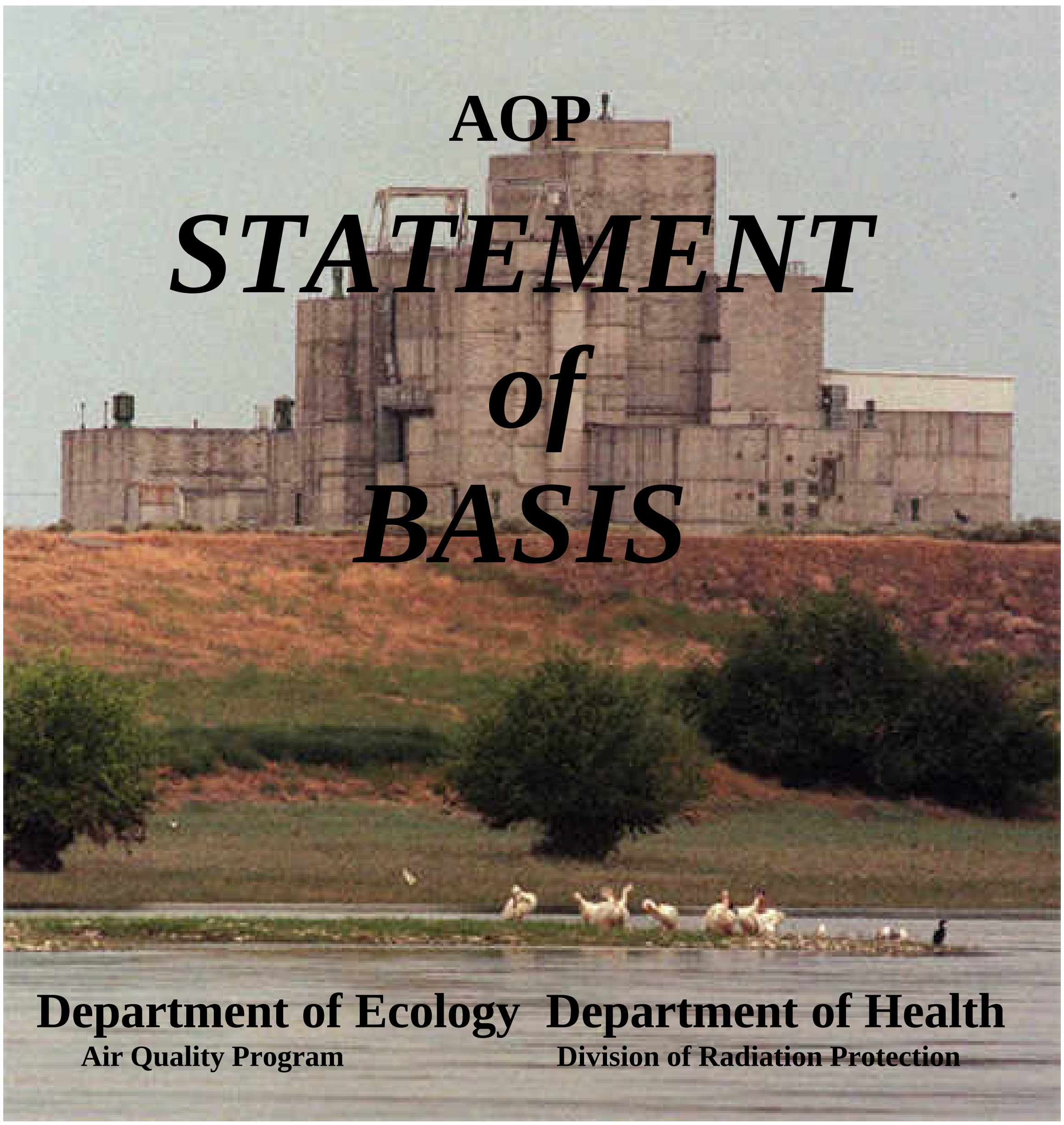
January 2001

DRAFT

HANFORD



AOP

STATEMENT of BASIS

Department of Ecology
Air Quality Program

Department of Health
Division of Radiation Protection

January 2001

Statement of Basis

For
Hanford Site Air Operating Permit No. 00-05-006

State of Washington Department of Ecology

The Statement of Basis (Statement) is issued by the permitting agencies as a separate supporting reference document to this air operating permit. This Statement of Basis is non-enforceable and sets forth the legal and factual basis for the permit conditions. It includes references to the applicable statutory or regulatory provisions, technical supporting information on specific emission units, and clarifications of specific requirements.

[WAC 173-401-700(8)]

Table of Contents

1. Basis for inclusion of facility in the Air Operating Permit (AOP) Program

The Hanford Site is included in the FCAA Title V AOP Program because:

- Actual emissions of sulfur dioxide, nitrogen oxides, and carbon monoxide exceed 100 tons per year.
- There are actual emissions of radionuclides, a NESHAP pollutant.
- The cumulative emissions of hazardous air pollutants exceed 25 tons per year.

2. Definitions

Definitions used in this permit are incorporated by reference as contained in WAC 173-401-200, WAC 173-400-030, and WAC 173-460-020. Specific definitions unique to this permit include the following:

Discovery – qualitative determination that a potential threat to public health or safety exists or existed after an evaluation of pertinent information.

Permitting Authority – in the Hanford Site Air Operating Permit are the State of Washington Department of Ecology, the State of Washington Department of Health, and the Benton Clean Air Authority; with Ecology acting as the lead agency. The State of Washington Department of Health and the Benton Clean Air Authority regulatory authority pursuant to the terms and conditions of the Hanford Site Air Operating Permit is described in Sections 3 and 4 of this statement of basis.

Significant emission unit or activity - For regulated air pollutants excluding radionuclides, this is an emission unit that does not meet the criteria of insignificant emission units as described in WAC 173-401-530.

3. Regulatory relationship between Ecology and Health

Following is the memorandum-of-understanding between the Health and Ecology regarding the regulation of radionuclide air emissions on the Hanford Site.

January 2001

MEMORANDUM OF UNDERSTANDING

Between the

Washington State Department of Ecology

and the

Washington State Department of Health

Related to the

RESPECTIVE ROLES AND RESPONSIBILITIES

OF THE TWO AGENCIES IN COORDINATING ACTIVITIES

CONCERNING HANFORD SITE RADIOACTIVE AIR EMISSIONS

PURPOSE

This Memorandum of Understanding (MOU) is made and entered into by and between the Washington State Department of Health (Health) and the Washington State Department of Ecology (Ecology) pursuant to authorities granted within Chapters 43.70, 43.21A, 70.94, and 70.98 of the Revised Code of Washington (RCW). This MOU is created in response to the agencies' recognition of the need to protect both the environment and public health from radioactive air emissions, and in recognition of the current dual regulation of such emissions under Ecology and Health requirements. The purpose of this MOU is to clarify the respective roles of Health and Ecology in the issuance and administration of air operating permits and the performance of new source reviews, recognizing Health as the state agency primarily responsible for regulation of Hanford facility radioactive air emissions (except as provided in Clause 5 of Ecology's Roles and Responsibilities) and Ecology as the agency responsible for environmental protection, as described in this MOU, including both nonradioactive air and radioactive air issues with specific responsibilities for radionuclides outlined below.

BACKGROUND

Health and Ecology share responsibility for the control of radioactive air emissions pursuant to state and federal statues. Both agencies have authority to set standards for and regulate radioactive air emissions per RCW 70.94 and RCW 70.98.

This MOU is designed to aid coordination between the agencies, and to avoid conflicting regulatory requirements pertaining to radioactive air emissions at the Hanford facility. This MOU defines the respective roles of Health and Ecology in the regulation of Hanford Site radioactive air emissions, including the determination of compliance and radioactive air emissions control technology standards and the performance of new source review. NOTE: This document does not affect NESHAPs delegation.

RECITALS

Chapter 70.94 RCW and Chapter 173-401 WAC establish a comprehensive air operating permit program in Washington State consistent with the requirements of Title V of the federal Clean Air Act (42 U.S.C. 7401, et seq.). All sources subject to these laws and regulations must have a permit to operate that assures compliance by the source with all applicable requirements.

Air emissions, including radioactive air emissions, at the Hanford Site must be covered under an air operating permit. The Department of Energy (Energy) will be required to submit two copies of its air operating permit application--one to Health for the regulation of radionuclides and one to Ecology for the regulation of nonradioactive air emissions. Health will issue a radionuclide air emission license (hereinafter “rad license” or “license”) to be incorporated into the air operating permit as an applicable requirement. A permit will be issued by Ecology with Health as a signatory reviewer and issuer of the rad license portion of the permit--Health will have primary responsibility for regulating radionuclide air emissions through rule-making under WAC 173-480. Ecology will regulate all nonradioactive air emissions. Ecology will be responsible for permit processing activities, and radionuclide regulatory requirements established by Health will be incorporated into the permit in accordance with the interagency procedures outlined below. One or more air operating permits will be issued for Hanford in phases over a three-year period. Health and Ecology will work with Energy to establish a schedule of application submittals. All air operating permits for the Hanford facility will be issued by Ecology and reviewed by Health. All future re-openings, revisions and renewals of permits will follow the same process as outlined in this MOU.

NOTE: Wherever practicable, the provisions of this MOU shall apply to new source review as well as to operating permits.

DEFINITIONS

The definitions of terms contained in Chapters 173-400 and 173-401 WAC are incorporated by reference, unless otherwise defined here. Unless a different meaning is clearly required by context, the following words and phrases, as used in this MOU, shall have the following meanings:

> “Compliance determination” refers to the process whereby Health verifies how and whether a specific source meets standards set by Ecology in 173-480 WAC.
>
> “License” or “rad license” refers to the document issued by Health that prescribes the relevant control requirements for radionuclide air emissions.

“Permit” or “operating permit” refers to the document issued by Ecology to sources in accordance with Chapter 173-401 WAC and Title V of the federal Clean Air Act (42 U.S.C. 7401, et seq.). The operating permit gathers in one document all air emission limitations and requirements that apply to a given source.

“Primary or Primarily” - While both Ecology and Health have authority to regulate radionuclide air emissions under RCW 70.94 and RCW 70.98, respectively, <primary> exercise of that authority means that, unless extenuating circumstances exist (for example, see Clauses 5 and 6 in the Joint Rules and Activities section), Health will be responsible for the particular activity.

“Standard” refers to any requirement established by Ecology through revision of Chapter 173-480 WAC that limits the quantity, rate or concentration of emissions of air pollution on a continuous basis including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under 173-480.

RESPECTIVE ROLES AND ACTIVITIES OF
THE DEPARTMENT OF ECOLOGY AND HEALTH

The parties to this MOU describe their responsibilities as follows:

Ecology

1. Ecology will issue the air operating permit.

2. Ecology will continue to be the state agency responsible for federal and state regulation of nonradioactive hazardous air pollutants at Hanford.

3. Ecology will be the point of contact for issues and questions involving nonradioactive air emissions.

4. Ecology will be the state agency responsible for determining requirements related to control technologies for nonradioactive air emissions.

5. Ecology will set air quality and emission standards for radioactive air emissions by amending Chapter 173-480 WAC.[1]

Health

1. Health will be the state agency primarily responsible for regulation of Hanford Site radionuclide air emissions (except as provided in Clause 5 of Ecology's Roles and Responsibilities). This responsibility does not alter, in any way, existing statutory authorities of Health or Ecology.

2. Health will be the state agency primarily responsible for evaluating airborne radionuclide emissions, including during new source reviews, and the agency responsible for the issuance of a radionuclide license that will be incorporated into the Hanford air operating permit consistent with such evaluations.

3. Health will be the point of contact for issues and questions pertaining to the regulation of Hanford Site radioactive air emissions.

[1]Addition of this clause clarifies that the vehicle anticipated to be the primary way for Ecology to regulate is through the establishment of standards by the rule revision process and does not eliminate any powers that Ecology may have to regulate if Health fails to perform. The Joint Responsibilities section refers to scenarios in which Ecology may exercise its authority in other ways.

4. Health will be the state agency primarily responsible for evaluating airborne radioactive emissions in order to verify that offsite doses comply with applicable human health standards, and that site worker exposures from radionuclide air emissions are as low as reasonably achievable.

5. Health will be the state agency primarily responsible for the implementation of state and federal requirements for radioactive air emission control technology, using United States Environmental Protection Agency (EPA) guidance for "top down" Best Available Control Technology (BACT). In Health's regulations the BACT process has been adapted to radionuclides and called BARCT in accordance with WAC 173-480.

6. Health will establish control requirements for radionuclides for Hanford in a license that will be incorporated into the air operating permit for Hanford.

7. If Health's rules regulating the air emissions of radionuclides have not been approved by EPA under §112(1) of the federal Clean Air Act Amendments of 1990 by the time the first operating permit for Hanford is due to be issued, Health will assist Ecology with writing the conditions of the radionuclide NESHAPs into the air operating permit for Hanford.

JOINT ROLES AND ACTIVITIES OF THE DEPARTMENTS OF ECOLOGY AND HEALTH

The parties to this MOU recognize and agree to the following:

1. A staff point of contact for each agency will be identified for each Hanford Site new source or source modification to ensure that both agencies' interests are maintained, and to ensure that requirements placed on Hanford facilities are compatible.

2. If it can be demonstrated by Ecology that there will be risk to the public or to the environment without the use of technology different than that proposed by Health, Ecology may request that Health implement the different technology. Health will consider Ecology's request and justify its conclusion on whether to implement the requested technology. If the two parties cannot agree, the issue shall be referred to the General Dispute Resolution Process outlined in this MOU.

3. Both Ecology and Health are committed to cooperation and the sharing of pertinent information in order to aid compliance with applicable regulations, and to ensure protection of both human health and the environment.

4. In accordance with RCW 70.94.162(1) and §502(b)(3) of the federal Clean Air Act Amendments of 1990, air operating permit fees will cover all costs involved in administering the Operating Permit program with respect to sources of air emissions. Health will bill Energy and collect fees separately for all costs incurred by Health in regulating the radionuclides portions of the air operating permit. Ecology's permit program costs will include permit administration costs and development and oversight costs associated with Health's regulatory activities. Ecology will also bill Energy and collect fees separately for all costs incurred by Ecology in the setting of standards and regulation of radionuclide air emissions, as well as for all costs incurred by Ecology in regulating nonradioactive air emissions. To avoid billing Energy for overlapping costs regarding the Hanford facility, both agencies shall follow Ecology's cost accounting and tracking requirements as set out in proposed 173-401 WAC, Part IX. There will be separate costs for separate duties under separate authorities.

5. Both Ecology and Health have identical enforcement authority, and access to all applicable areas of the Hanford facility for inspections by both or either of the agencies will be a condition of the permit. Health will assume primary responsibility for inspection and enforcement actions that involve only radionuclides at Hanford, including the issuance of notices of violations and any judicial proceedings that stem from such actions. Ecology will have responsibility for inspection and enforcement actions that involve only nonradionuclides at Hanford, including the issuance of notices of violations and any judicial proceedings that stem from such actions. Wherever inspections or enforcement actions involve both radionuclide and nonradionuclide air emissions at Hanford, both agencies will share responsibility, including responsibility for issuance of notices of violations and any judicial proceedings that stem from such actions. However, in all instances of suspected violation, the agencies will confer before a notice of violation is issued (unless an imminent and substantial threat to the environment or human health exists--see below). The EPA will have enforcement authority over all federally enforceable portions of the permit.

If in Ecology's judgement it can be demonstrated that there is risk to the public or to the environment, Ecology will consult with Health. If Health fails to adequately address Ecology's concerns, the Dispute Resolution process outlined in this document will be followed, beginning at the section manager level. If a dispute arises as to which agency is responsible for enforcement, the dispute resolution procedures outlined in this MOU shall be followed, except as provided in Clause 6 of the Joint Roles and Activities Section. No enforcement action on the issue under consideration may be taken by either party until the full dispute resolution procedures have been followed, except as provided in Clause 6 of the Joint Roles and Activities Section.

6. If either agency recognizes an imminent and substantial threat to human health or the environment, that agency may take steps to mitigate the problem, then consult the other agency and, if warranted, follow the dispute resolution process.

7. Under the timeline requirements for operating permit issuance, Health will handle all radionuclide, and Ecology will handle all nonradionuclide air operating permit issuance procedures and requirements as per this MOU. Ecology will submit notices of permit issuance, modifications of renewals to the Permit Register as required under WAC 173-401-805. The two agencies will hold joint hearings and will jointly assure proper notice of hearings. The two agencies will jointly prepare responses to public comments. Ecology will submit notices, comments and the proposed permit to EPA.

8. The Nuclear and Mixed Waste Management Program of Ecology (NMWMP) and Health shall submit a final copy of each permit to the Ecology Air Quality Program. Both the NMWMP and Health shall follow the reporting requirements, specifically for Notices of Violation, that are detailed in the Air Program Compliance Plan.

9. Under the timeline requirements for operating permit issuance, permitting authorities have 180 days between the time a completeness determination is made and the time when the Draft Permit or Renewal is due. See attached "Permit Issuance Timeline." Under this MOU, each agency (Ecology and Health) shall submit to the other a Draft of its license or portion of a Hanford Operating Permit within 90 days after the date that a completeness determination is due or made. Each will then have 30 days to send comments to the other agency. Each agency will then have 30 days to respond to the comments and revise the license or the original Draft Permit. Each agency will have discretion to consider comments received after the thirty-day comment period has expired. If a disagreement exists or one agency believes the other agency's response to the comments is insufficient, the issue shall follow the dispute resolution process outlined in this MOU, but in no event shall the deadlines for permit submittals to the EPA be missed.

GENERAL RESOLUTION OF DISPUTES

Both agencies recognize the time constraints that are involved with meeting the operating permit deadlines under the federal Clean Air Act and commit to resolving disputes as expeditiously as possible. Disputes arising from the implementation of this MOU will be resolved at the lowest level possible utilizing standard agency chains of command. Elevation to Ecology's Assistant Director for Waste Management, Ecology's Assistant Director for Central Programs and Enforcement and Health's Assistant Secretary for Environmental Health Programs shall occur only after all reasonable efforts at the Program and Division level have failed or after two weeks after a comment period deadline has passed, whichever comes first. If the dispute still cannot be resolved at the Assistant Director and Assistant Secretary levels, the dispute shall be referred to the Director of Ecology and the Secretary of Health. If the dispute cannot be resolved at the highest agency levels within one week, the dispute shall be referred to the Governor's Office. Both agencies shall refrain from issuing a final determination until all disputes are resolved, but in no event shall the deadlines for permit submittals to the EPA be missed.

EFFECTIVE DATE, MODIFICATION, AND TERMINATION

This Memorandum of Understanding shall be effective upon signature by the parties, may be amended by mutual consent, and may be terminated by either party after giving thirty days' notice to the other party.

Signatures:

(Original signed)
Eric Slagle, Assistant Secretary
Washington Department of Health

Date 12-23-93

(Original signed)
D.J. Patin, Assistant Director
Central Programs and Enforcement
Washington Department of Ecology

Date 12-29-93

(Original signed)
Dan Silver, Assistant Director
Waste Management
Washington Department of Ecology

Date 12-23-93

4. Regulatory relationship between Ecology and Benton Clean Air Authority

Following is the text of the March 11, 1994 letter from the Washington State Department of Ecology to the Benton-Franklin Counties Clean Air Authority:

March 11, 1994

David A. Lauer, Director
Benton-Franklin Counties
Clean Air Authority
650 George Washington Way
Richland, WA 99352-4289

Dear Mr. Lauer:

Re: Delegation of Asbestos and Open Burning Regulatory Responsibility

After receiving your letter of December 15, 1993, regarding asbestos and open burning at the Hanford Site, I realized your immediate concern about these two issues. I have asked Mr. Joe Stohr, Manager of the Technical Assistance and Regulatory Coordination Section, to work on these issues.

In discussing this matter with Mr. Myron Saikewicz, Manager of the Engineering Section at Ecology's Air Quality Program, we agreed that the Benton-Franklin Counties Clean Air Authority (BFCCAA) should continue to handle asbestos and open burning issues at the Hanford Site. The Nuclear Waste Program is not planning to actively exercise its preemptive authority under RCW 70.105.240 and regulate asbestos and open burning at the Hanford Site. I feel that the Benton-Franklin Counties Clean Air Authority has the needed qualifications and experience to accomplish these regulatory functions at Hanford.

Ecology exercises "preemptive" authority for all regulatory functions at certain hazardous waste management facilities, including Hanford, based upon RCW 70.105.240. Since Hanford is a federal facility, Ecology exercises this authority only in areas where the federal government has waived its sovereign immunity. Under the Federal Clean Air Act, the federal government has waived sovereign immunity at Hanford. Ecology, therefore, can preempt local government or other state agencies in regulating asbestos and open burning at Hanford.

Ecology remains reluctant to assume preemptive responsibility in areas where local government is clearly qualified to accomplish such regulatory responsibilities and where it is more appropriate for Ecology to delegate such responsibility. In the case of asbestos and open burning regulations, I believe it is appropriate to delegate such authority to the BFCCAA. This delegation, therefore, extends to BFCCAA, the authority to ensure compliance with 40 CFR 61, Asbestos, Handling, Notifications, and Reporting. WAC 173-425, and applicable local regulations at the Hanford Site.

Mr. David A. Lauer
March 11, 1994
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In order to further clarify the issues, I would like to respond to the questions addressed in your letter as follows:

1. The BFCCAA will continue to serve the role that your agency currently has as the recipient of asbestos notifications required under 40 CFR 61.145(b).

2. Ecology does not grant BFCCAA the authority to collect permit fees. The BFCCAA must decide for itself whether to collect such fees based on its regulatory authority.

3. Your agency will be responsible for permitting and inspecting fire training areas, and open burning at the Hanford Site.

4. Your agency will be lead for enforcing the regulations regarding demolition by burning and for gaining compliance with the state open burning regulations at the Hanford Site. Mr. Dave Nylander of our Kennewick Office needs to be contacted by your office on these issues.

Please be advised that Ecology can withdraw this delegation at any time. However, we will not exercise this option without providing prior notice to BFCCAA. In addition, we believe that RCW 70.105.240 does not give Ecology the option of delegating its final decision-making authority over preempted matters, notwithstanding any delegation to exercise day-to-day regulatory responsibility. Therefore, we request that your office inform Mr. Dave Nylander of our Kennewick Office, prior to taking any final permitting or enforcement actions at Hanford.

We look forward to a positive and cooperative working relationship with BFCCAA, as we work to assure the health and safety of the citizens of the state. Questions regarding this matter should be addressed to Mr. Bob King at (206) 407-7147. Thank you for bringing this matter to our attention.

Sincerely,

Original signed by Dru Butler

Dru Butler
Program Manager
Nuclear Waste Program

DB:BK:db

cc: James Bauer, DOE-RL

5. Insignificant emission units and activities

Hanford Site insignificant emission units and activities in operation at the time of permit issuance are described in the Hanford Site Air Operating Permit Application (DOE/RL-95-07) submitted by DOE. The application is on file at the following address:

Nuclear Waste Program
State of Washington Department of Ecology.
1315 W. 4th Avenue
Kennewick, WA 99336-6018

6. Acceptable source impact level (ASIL)

Acceptable Source Impact Levels (ASILs) as defined in WAC 173-460, "Controls For New Sources of Toxic Air Pollutants", are not emission standards or limitations applicable to the Hanford Site. ASILs are a concentration of a toxic air pollutant in the outdoor atmosphere used to evaluate the air quality impact of a new or modified toxic air pollutant emission source for new source review purposes.

7. Completed activities associated with approval orders and permits

Approval orders applicable to activities will end at activity completion, as described in the NOC application. The permittee is not required to continue to comply with approval order terms and conditions after they become irrelevant. For example, many approval orders contain the requirement to conduct an initial, one time only, startup test. Once that initial startup test requirement has been satisfactorily completed, that condition is deemed irrelevant, and the permittee is no longer bound by that particular requirement.

The NOC or the approval conditions identified in this table have been completed.

Emission Point	Project	Permit No	Conditions
100 J-NONPOINT 006	100-N Emergency Dump Basin	NWP 95-1300N EDB	Obsolete NOC
100K Cold Vac. Drying	Cold Vacuum Drying - Phase I	96NM-091	Obsolete NOC
100N S-RCF-EX 001	Environmental Analytical Lab (EAL)	NWP 95(8)-100N/EAL	Obsolete NOC
200 P-296P032-001	Rotary Mode Core Sampling (RMCS) System	NOC-93-04	Obsolete NOC

Emission Point	Project	Permit No	Conditions
	#2		
200 P-296P032-001	Rotary Mode Core Sampling (RMCS) Systems #2	Letter	Obsolete NOC
200 P-296P033-001& P-296P034-001	Rotary Mode Core Sampling (RMCS) Systems 3 & 4 and Modification to 2	NWP 95-RMCS(3)	Obsolete NOC
200E C-106 Sluicing	241-C-106 Tank Sluicing, Phase II	97NM-001	(obsolete) VOC 50 ppm measured as total organic carbon
200E Hot Condt. Annex	Hot Conditioning Annex	96NM-092	Obsolete NOC
200E P-2025E ETF	Effluent Treatment Facility (ETF) (2025 E), Approval of NOC Application for Nonradioactive Air Emissions	NOC-93-3	(obsolete, VOCs now regulated under RCRA Subpart AA) VOC emissions from stream number G6 shall not exceed 0.50 gram per minute. VOC emissions of the G6 stream shall also not exceed 0.55 gram per cubic meter at standard conditions. Compliance shall be de
200E P-2025E ETF	Effluent Treatment Facility (ETF) (2025 E), Approval of NOC Application for Nonradioactive Air Emissions	NOC-93-3	(obsolete) Within 180 days of start-up of the facility, Energy shall conduct performance tests for VOC at the location G6. Based on the initial results of the performance tests, the department may require Energy to conduct a periodic performance test for
200E P-2025E ETF	Effluent Treatment Facility (ETF) (2025 E), Approval of NOC Application for Nonradioactive Air Emissions	NOC-93-3	Opacity from each stack shall not exceed 5 percent as measured by EPA Reference Method 9 as described in 40 CFR Part 60, Appendix A, dated July 1, 1992.
200E P-2025E ETF	Effluent Treatment Facility (ETF) (2025 E), Approval of NOC Application for Nonradioactive Air Emissions	NOC-93-3	(obsolete) This final approval shall become void if construction of this unit is not commenced within eighteen (18) months after issuance of this final approval, or if construction or operation of

Emission Point	Project	Permit No	Conditions
			these units is discontinued for eighteen (18) consecutive
200E P-296A042-001	241-AZ-101 Tank Waste Retrieval and 241-AY/241-AZ Tank Farms Ventilation Upgrades, Project W-151 and Project W-030	NOC 94-07	(obsolete) VOCs 0.001 lb/hour
200E P-296C007-001	C-103 Ventilation Upgrades	NWP 95-TK C-103	Obsolete NOC
200E P-296C007-001	C-103 Ventilation Upgrades, Approval for Alternate Sampling and Analysis Method.	NWP 95-TK C-103 Modification	Obsolete NOC
200E P-296P034-001	Rotary Mode Core Sampling (RMCS) Systems 3 & 4 and Modification to 2	NWP 95-RMCS(3)	Obsolete NOC
200E P-296P041-001	241-A-101 Tank portable exhauster		Obsolete NOC
200W F-284WB 001	Backup Package Boiler	NOC-94-06	Obsolete NOC
200W F-284WB 001	Backup Package Boiler	NOC-94-06A	Obsolete NOC
200W P-WRAP1 001	Waste Receiving and Processing (WRAP1)	NOC 93-05	After start-up of the facility, RL shall conduct performance tests for VOCs. After these tests, Ecology may require RL to conduct an annual test(s) for those pollutants.
200W P-WRAP1 001	Waste Receiving and Processing (WRAP1)	NOC 93-05	After start-up of the facility, RL shall conduct performance tests for particulates. After these tests, Ecology may require RL to conduct an annual test(s) for those pollutants.
200W P-WRAP1 001	Waste Receiving and Processing (WRAP1)	NOC 93-05	Opacity 5 %
200W P-WRAP1 001	Waste Receiving and Processing (WRAP1)	NOC 93-05, Revision Approval	(obsolete, not a requirement as only mentioned in a letter) RL shall notify Ecology at least 14 days prior to initial processing of retrieved waste at WRAP.

Emission Point	Project	Permit No	Conditions
300 300 Area Fuel Supply	300 Area Fuel Supply Shutdown Facilities, Building 303F and 334A	DE 98NWP-001	Obsolete NOC
300 EP-3020-01-S	Environmental Molecular Sciences Lab (EMSL)	NOC 94-08	Obsolete NOC Revision
300 EP-3020-01-S	Environmental Molecular Sciences Lab (EMSL)	NOC 94-08	(obsolete) No NOC is required, provided the total building emissions meet the acceptable source impact levels (ASILs) and the Washington Administrative Code (WAC) 173-400-110 new source review (NSR) thresholds. Total building emissions will be the sum of
300 EP-3020-01-S	Environmental Molecular Sciences Lab (EMSL)	NOC 94-08	(obsolete) A new NOC will be required if total building emissions of TAPs exceed the SQERs, unless a T-SCREEN analysis is run that shows the emissions of criteria pollutants would result in concentrations less than the ASILs, or if total building emissions
300 EP-3020-01-S	Environmental Molecular Sciences Lab (EMSL)	NOC 94-08	(obsolete) No additional testing is required under this Order.
300 EP-3020-01-S	Environmental Molecular Sciences Lab (EMSL)	NOC 94-08	(obsolete) Total building emissions, excluding otherwise exempt emissions, to meet ASILs of WAC 173-460 and NSR thresholds of WAC 173-400-110.
300 EP-3020-01-S	Environmental Molecular Sciences Lab (EMSL)	NOC 94-08	(obsolete) Emissions to meet NSR threshold limits of WAC 173-400-110
300 EP-3020-01-S, EP-3020-02-S, EP-3020-03-S, EP-3020-04-S, EP-3020-05-S, EP-3020-06-S	Construction and operation of Environmental Molecular Sciences Laboratory (EMSL) emission points	NOC-94-08	(obsolete) ammonia (sum of 5 chemical stacks) 0.01 lb/hr

Emission Point	Project	Permit No	Conditions
300 EP-3020-01-S, EP-3020-02-S, EP-3020-03-S, EP-3020-04-S, EP-3020-05-S, EP-3020-06-S	Construction and operation of Environmental Molecular Sciences Laboratory (EMSL) emission points	NOC-94-08	(obsolete) VOC (sum of 5 chemical stacks) 0.24 lb/hr
300 EP-3020-01-S, EP-3020-02-S, EP-3020-03-S, EP-3020-04-S, EP-3020-05-S, EP-3020-06-S	Construction and operation of Environmental Molecular Sciences Laboratory (EMSL) emission points	NOC-94-08	(obsolete) RL shall submit normal emissions and revised maximum emissions for all TAP released from each of 5 chemical stacks to Ecology within 15 months after the EMSL starting operation
300 EP-3020-02-S, EP-3020-03-S, EP-3020-04-S, EP-3020-05-S, EP-3020-06-S, EP-3020-07-S, EP-3020-08-S, EP-3020-09-S, EP-3020-10-S, EP-3020-11-S	Environmental Molecular Sciences Lab (EMSL) chemical stacks	NOC-94-08	(obsolete) Operating and maintenance manuals and/or procedures for all equipment that has the potential to affect emissions to the atmosphere shall be developed and followed. Copies shall be available to Ecology.
300 EP-3020-07-S EP-3020-08-S, EP-3020-09-S, EP-3020-10-S, EP-3020-11-S	Environmental Molecular Sciences Lab (EMSL) EP-3020-07-S Natural gas fired boilers	NOC-94-08	EMSL natural gas-fired boilers may be operated on diesel fuel containing a maximum of 0.05% sulfur for up to 96 hours per year.
300 EP-3020-07-S EP-3020-08-S, EP-3020-09-S, EP-3020-10-S, EP-3020-11-S	Environmental Molecular Sciences Lab (EMSL) EP-3020-07-S Natural gas fired boilers	NOC-94-08	(obsolete) The following emission units: * Three operating or standby 5 MMBTU/hr gas-fired hot water boilers utilizing natural gas (300 EP-3020-07-S through -09-S) * Two inactive 4 MMBTU/hr gas-fired steam boilers utilizing natural gas (300 EP-3020-10-
300 EP-306W-03-V	Operation of Material Development Laboratory and Catalytic Electrochemical Oxidation Unit (CEO)	DE 98NWP-002	Obsolete NOC
300 EP-324-01-S	324 building modification	NWP 95-300/324 Lab	Obsolete NOC

Emission Point	Project	Permit No	Conditions
300 EP-324-01-S	Operation of a Plasma Arc Furnace in the 324 Building	NWP-96-2	Obsolete NOC
300 EP-331-01-V	Life Sciences Laboratory I (Building 331) Modifications	97NM-147	A new Notice of Construction shall be filed if emissions of criteria pollutants exceed the following thresholds: Carbon Monoxide - 20 tons/year Nitrogen Oxides - 8 tons/year Sulfur dioxide - 8 tons/year Volatile Organic Compounds - 8 tons/year Pa

8. Opacity monitoring requirements on stacks equipped with HEPA filters

Ecology acknowledges that the opacity monitoring requirements from mixed airborne effluent streams are not necessary due to the presence of HEPA filtration abatement technology required by Health under WAC 246-247. HEPA filters control particulate emissions to less than visible levels. Because of the particulate control effectiveness provided by HEPA filters, no additional opacity monitoring is required for those emission units required to have HEPA filters that are listed in Attachment 2, Tables 1.0, 1.1, or 1.2 (Health imposes significant monitoring requirements on HEPA filters).

9. Inapplicability of other regulations

Regulations promulgated under statutory authority other than the FCAA (e.g. RCRA and CERCLA) are not Title V applicable requirements and are not included in this air operating permit. Examples include Subparts AA, BB, and CC of 40 CFR 264 and 265. In addition, actions taken pursuant to CERCLA are exempt from permitting and other administrative requirements.

10. Permittee privatization contracts

When a facility or entity is located on the Hanford Site, the presumption is that the facility or entity is under DOE's control. Several entities identified in Section 10 above operate on the Hanford site under a contract or lease but are not under DOE's control. The presumption of common control may be overcome and DOE may seek to exclude an entity from the Hanford

Site Air Operating Permit on a case-specific basis after DOE examines the contract or lease and intended or actual operations.

The following criteria will be used by Ecology to determine whether DOE controls an entity on the Hanford site.

Criteria used to determine DOE control includes but is not limited to the items listed below:

1. Does the entity provide DOE related services?
2. Does the entity process DOE source materials or provide a product to DOE?
3. Is the entity dependent on DOE?
4. Can the entity purchase raw materials from and sell products or byproducts to other customers?
5. If the entity provides personnel related services such as a day care, gas station or dry cleaners, is the percentage of the entity's output provided to DOE greater than 50%?
6. Do the lease/contract terms indicate that DOE will control the entity?
    a) What do the lease/contract terms indicate with regard to pollution control/permitting responsibilities?
    b) Who accepts responsibility for compliance with air quality control requirements? What about for violations of the requirements?
    c) Does DOE have the power to issue a stop-work order to the entity for incidents or conditions harmful to the environment?
    d) Does DOE exercise directing influence over the entities economic or other pollutant-emitting activities?
    e) Does DOE have the power to make or veto decisions to implement major emission-control measures or to influence production levels or compliance with environmental regulations?
    f) Does DOE control the performance of the entity?
7. Can DOE make decisions that affect the entity's pollution control technologies?
8. Does the entity share products, byproducts, equipment, other property, or pollution control equipment with DOE?
9. Does the entity share a common workforce, plant manager, security forces, corporate executive officers, payroll activities, employee benefits, health plans, retirement funds, insurance coverage or other administrative functions?

11. Exclusion of activities and facilities on leased land, in leased facilities, or on land adjacent to the Hanford Site

There are a number of privatized commercial facilities including nuclear power plant and a research facility to study gravitational waves located within the boundaries of the Hanford Site. Ecology has concluded these activities are not under the common control of DOE, and, consequently they are not part of the Hanford Site. [WAC 173-401-200(17)]

The following is provided to support the determination to exclude those facilities and activities listed in Section 2.0 of the Standard Terms and Conditions portion of the Hanford Site Air Operating Permit. All future excluded facilities and activities will follow the process outlined in Section 12 of this Statement of Basis.

- **Allied Technology Group Corporation, Richland facility**

  The Allied Technology Group Corporation operates a low-level radioactive waste decontamination, super-compaction, and packaging disposal facility. The percentage of Allied Technology Group, Inc. (ATG) service output provided to USDOE is far less than 50% in terms of shipment or gross weight. Out of the 250 shipments received through 1998, only 30 were from USDOE's Hanford Site (11% by weight, and 21% by volume). A private entity outside the Hanford Site would not be considered a "support facility" to USDOE under the guidance on "common control" if the percentage of the entity's output or service provided to USDOE is less than 50%. Based on the current mode of operation, ATG shall not be added to the Hanford Site Title V AOP.

- **Interstate Nuclear Services laundry**

  Interstate Nuclear Services (INS) provides cleaning and decontamination services for personnel protection clothing and respirator masks. INS was dependent on USDOE as a Hanford spinoff operation back in 1992-1993 period. However, INS solicited business from other USDOE sites including the Idaho National Environmental Engineering Laboratory and the Sandia National Laboratory. The percentage of the entity's service output provided to USDOE's Hanford Site is currently less than 50%; and the trend appears to be stabilizing for the foreseeable future at about 30%. An entity outside the Hanford Site would not be considered a "support facility" to USDOE under the guidance on "common control" if the percentage of the entity's output provided to USDOE's Hanford Site is less than 50%. Based on the current mode of operation, INS shall not be added to the Hanford Site Title V AOP either.

- **Battelle Richland North facilities**

  Battelle Pacific Northwest operates a multiprogram laboratory research and development (R&D) center. Both investigative research and design development activities are conducted within the Richland North Complex (RCHN). Activities are distributed between analytical studies (paper studies); software development; hardware development; hardware design, development, and testing (e.g., instrumentation, robotics, sensors, laser systems, NDE, etc.); energy systems design, analysis and monitoring, and laboratory based investigative scientific research. The RCHN accommodates a client base that involves both Government agencies and private business as well as foreign and domestic clients. The percentage of the entity's service output provided to USDOE's Hanford Site is currently less than 50%. An entity outside the Hanford Site would not be considered a “support facility” to USDOE under the guidance on “common control” if the percentage of the entity’s output provided to USDOE's Hanford Site is less than 50%. Based on the current mode of operation, the RCHN shall not be added to the Hanford Site Title V AOP.

- **Applied Process Engineering Laboratory**

  The Applied Process Engineering Laboratory (APEL) was a joint project with the DOE, the City of Richland, the Port of Benton, and Energy Northwest. Currently APEL is owned and operated by Energy Northwest, has its own Resource Conservation and Recovery Act (RCRA) Part B permit, and obtains its own Benton Clean Air Authority permits. APEL tests and develops new technologies that can be used in Hanford's cleanup, as well as provides an incubator for entrepreneurs who want to establish technology-based businesses. APEL is not under the "common control" of USDOE.

- **The Laser Interferometer Gravitational-Wave Observatory**

  The Laser Interferometer Gravitational-Wave Observatory (LIGO) is a research facility on the Hanford Site that is being funded by the National Science Foundation (NSF). It was designed and is being constructed by a team of scientists from the California Institute of Technology and the Massachusetts Institute of Technology for the purpose of detecting cosmic gravitational waves and harnessing these waves for scientific research. LIGO does not supply any USDOE related services, and is not under the "common control" of USDOE.

- **all Energy Northwest (formerly Washington Public Power Supply System) facilities**

  Energy Northwest is a commercial producer of electrical power, does not supply any USDOE related services, and is not under the "common control" of USDOE.

- **all Port of Benton facilities**

  The Port of Benton is an economic development agency in Benton County. USDOE has transferred ownership of several parcels of land and several facilities in the 3000, 400 and 1100 Areas of the Hanford Site to the Port of Benton. The port will make the existing infrastructure and buildings available for new business and industry. The Port of Benton is not under the "common control" of USDOE.

- **US Ecology, Inc. commercial low-level radioactive waste burial site**

  US Ecology operates a commercial low-level radioactive waste burial site for the State of Washington on land leased from USDOE. This burial site receives low-level waste from commercial organizations, does not supply any USDOE related services, and is not under the "common control" of USDOE.

- **Kaiser Aluminum and Chemical Corporation extrusion press located in the 313 Building**

  This facility produces aluminum baseball bats for sale to the general public, does not supply any USDOE related services, and is not under the "common control" of USDOE.

- **Siemens Power Corporation, Nuclear Division**

  Siemens Power Corporation operates a commercial nuclear fuel fabrication facility near the southern boundary of the Hanford Site.
  The Siemens facility does not supply any USDOE related services, and is not under the "common control" of USDOE.

- **Livingston Rebuild Center, Inc.**

  USDOE signed a lease in March 1998 with Livingston Rebuild Center, a major railroad locomotive repair firm from Livingston, Montana for about one quarter of Hanford's 1171 Transportation Maintenance Building. Livingston Rebuild Center rebuilds locomotives and locomotive components for customers throughout the U.S., Canada and Mexico. The company is not under the "common control" of USDOE.

12. Notification of regulatory order (NOC) approval conditions

Table 1.6, Emission Limits and Periodic Monitoring Requirements for Emission Units With NOC Approval Conditions, includes only the emission limits and conditions identified in the "Approval Conditions" section of the regulatory orders. Information included in other sections of the orders, such as "Findings," "Background," "Description" or similarly titled sections are not included in Table 1.6.

13. Compliance with general standards for odor.

Section 1.3, Table 1.2, General Standards for Maximum Emissions, requires that the permittee use good practice and procedures to reduce odorous emissions to a reasonable minimum. Based on process knowledge and the lack of odor complaints filed with the regulatory agencies, Ecology has determined that the Hanford Site is not a source of odorous emissions. For these reasons, the complaint response program for odor control described in Table 1.2 is considered adequate to maintain odorous emissions at a reasonable minimum.

14. Compliance with general standards for fugitive emissions and fugitive dust.

Section 1.3, Table 1.2, General Standards for Maximum Emissions, requires that the permittee use reasonable precautions to control fugitive emissions and fugitive dust. The Hanford Site is not generally a source of fugitive dust and emissions, except during construction and demolition activities. Most of the construction activities occur in areas of the Hanford Site remote from site boundaries. The Hanford Site uses a system of pre-job planning and job safety analysis to reasonably control these emissions.

15. Compliance with emission limits for boilers identified in Table 1.4.

Table 1.3 identifies emission limits for fuel oil fired and natural gas fired steam generating units $5mmBTU/hr. These emission limits are the manufacturer's guaranteed maximum emission levels when the boilers are operated according to good combustion practices. The installed boiler configuration when operated using good combustion practices identified in Table 1.3 will not exceed the emission limits.

16. Shutdown or deactivated emission units

The Hanford Site Air Operating Permit Application, DOE/RL-95-07, contains several emission units that are not included in the proposed Hanford Site Air Operating Permit, NWP-AOP-99-1. The emission units that have been shut down or deactivated since issuance of the latest permit application amendment are as follows:

Internal combustion engines >500 horsepower
100D E-525 001
200W E-947 001
200E E-500 001
200E E-670 001
200E E-600 001
200E E-565 001
200E E-565 002

Fossil Fuel-fired steam generating units
200E F-284E 001 (Reg. ID 11)
200E F-284E 002 (Reg. ID 11)
200W F-284WB 001 (Reg. ID 21)
300 F-384 002 (Reg. ID 4)
300 F-384 006 (Reg. ID 8)

17. NOC Conditions Identified in Table 1.6

In attachment 1, Table 1.6 is intended to capture the periodic monitoring, emission limit, and other approval conditions for all emission units with NOC approval orders. However, Table 1.6 does not list all conditions included in the approval order as "Approval Conditions." Most of the excluded conditions have been captured elsewhere in the permit as applicable requirements. The categories of excluded approval conditions include the following:

- Conditions and requirements addressed in Section 3.0, Standard Terms and Conditions, of the Hanford Site AOP.
- Conditions and requirements addressed in Section 4.0, General Requirements, of the Hanford Site AOP, such as the condition to send reports to the Ecology office or the requirement to allow access to the facility for inspection.
- Conditions and requirements that re-state portions of applicable codified regulations.
- The requirement to prepare and maintain an Operation and Maintenance Manual.

Health

Statement of

Basis

Technical Support Document

Requirements for ALARACT Demonstrations

ALARACT Demonstrations Applicable Requirements (State only enforceable)

ALARACT [WAC 246-247-040(4)]
[WAC 246-247-010(4)]
[WAC 246-247-040(5)]

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR WATER LANCING	HNF-4327, Rev. 0		309

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

2. Monitoring:

   * Radiological surveys (swipes for removable contamination) of work area

   * Post job survey(s)

3. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6), if applicable

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment" (ALARACT 12)

   * During insertion and removal, radionuclide control is achieved by spraying the annulus between the lance outside diameter and riser inside diameter with water.

   * Verify passive or active HEPA filtration on tanks

   * Use approved containment guideline matrix from HNF-IP-0842, latest revision

   * HPT coverage will be performed as specified in the Radiological Work Permit

4. Description of Activity:

   Water lancing the waste in an underground storage tank is performed to determine the depth of the tank from the riser location and to prepare for equipment installation, such as salt well screens, jet pump assemblies and liquid observation wells. There are two types of water lances:

a) A long pipe approximately 7.62 cm in diameter with a single nozzle at the end. This design uses hot water (supplied by a truck) at low pressure, approximately 1034 kilopascals (150 psi). Use of this design may require the lance to be raised and lowered into the waste multiple times so that a large enough hole can be formed in the waste to accommodate the equipment to be installed in the hole.

b) A newer design lance has a 28 cm diameter pipe and multiple nozzles on the bottom to facilitate waste penetration. It is designed to create a large hole with one insertion of the lance into the waste. This design requires less (hot) water volume and operates at higher pressure, 20685 kilopascals (3000 psi).

In each case, a hose from a water truck is connected to the top end of the water lance. The water lance is inserted into a tank riser which has a water spray ring mounted within the riser. Additionally, a plastic sleeve is staged and tied off at the top of the lance for deployment during lance retrieval. During insertion of the water lance, air emissions are controlled by the use of the water spray ring. The water spray ring sprays water in the annulus between the outside diameter of the water lance and the inside diameter of the riser. The water lance is lowered until it penetrates the solid portions of the waste which need to be broken up to allow insertion of the saltwell screen or other equipment. The water lance withdrawal steps are the reverse of the insertion sequence. The water spray ring is used to wash radioactive tank waste from the outside of the water lance. Hand wiping of the lance may also take place immediately above the riser and below the plastic sleeving. Washing is repeated until radiation readings are <100 mrem/hr. If the lance cannot be decontaminated below 100 mrem/hr, the lance will be sleeved in plastic, removed from the tank, and stored. The pit or riser will be closed.

Contingency plans within the scope of this ALARACT demonstration are:

a) Removing the lance from the tank for further decontamination by washing, wiping or brushing. The activities will be conducted in accordance with the containment matrix guide found in HNF-IP-0842, latest revision.
Rev. 0
b) Replacement of contaminated parts if they cannot be adequately decontaminated as noted in (a) above. This activity will be conducted in accordance with the containment matrix guide found in HNF-IP-0842, latest revision.

c) Packaging, storing and transporting the lance "as is" if the external dose rates exceed 100 mrem/hr.

As the water lance is withdrawn from the tank, it is placed inside a plastic sleeve (during the withdrawal process), surveyed, and stored until its next use.

The actual water lancing time (residence time in waste) usually ranges from 10 minutes to 4 hours with an average time of about 30 minutes. Riser open time is minimized.

* Emission pathway - Existing active and passive point sources

* TWRS facility description - All TWRS SST's, DST's, and IMUSTs

Project Title	**Permit No**	**Date Approved**	**NOC_ID**
TWRS ALARACT DEMONSTRATION FOR WASTE TRANSFERS, HNF-4327, Rev. 0	HNF-4327, Rev. 0		355

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. TWRS Facility Description:

   * All TWRS facilities

2. Emission Pathway:

   * Existing active and passive point sources and fugitive non-point sources

3. Records/Documentation:

   * Flow rate and pressure engineering evaluations

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

4. Monitoring:

   * Process parameters monitored include tank pressure alarms and annulus and primary tank exhaust CAMs.

   * Record samplers

   * Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

   * Post job survey(s)

5. Radiological Controls:

   * Verify HEPA filtration on receiving tanks

   * Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment and Vehicles" (ALARACT 12)

   * Follow TWRS ALARACT demonstration for "Installation and Removal of Equipment from Tanks" (ALARACT 13)

   * Follow TWRS ALARACT demonstration for "Pit Work" (ALARACT 14)

6. Description of Activity/Requirements:

   Wastes are transferred to, from, and within actively ventilated tank farm storage facilities (i.e. double-shell tanks), chemical processing facilities, receiver vaults, mobile tanks, and evaporators. Wastes are also transferred from single-shell tanks during (and due to) salt well pumping. Transfers are made through a network of existing or to be installed above or below ground pipelines, operating equipment. Transfers also utilize the existing network of controls or transfer structures (currently in use, or constructed under a Notice of Construction) such as diversion boxes, valve pits, double contained receiver tanks, and diverter stations.

Jet, submersible, or transfer pumps are used to transfer waste at flow rates up to 300 gallons (1,132 liters) per minute. The cover blocks are reinstalled on the pits before starting any waste transfer operation.

Occasionally, water is added to a tank or transfer system to prevent or remove plugs. Other techniques to free blockages include chemical flushing, pressurization, temporary jumpers, hydraulic scouring, and the use of heat tracing. Flow rates and pressures used are determined by engineering evaluations. Flow into the sending/receiving tank is exhausted using a HEPA filtered vent.

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR PACKAGING AND TRANSPORTATION OF EQUIPMENT & VEHICLES	HNF-4327, Rev. 0		325

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. Description of Activity/Requirements:

   When entering or exiting the pit, ALARACT 6 "Pit Access" must be complied with.

   All equipment removed from the pit is decontaminated or contained. A temporary or permanent cover is placed over the pit if ever left unattended.

   Installing pit leak detectors, unplugging drains, and housekeeping/waste removal activities are performed following the above description.

   Specific activities performed in pits follows:

   Jumper Work:

   Before any jumper work takes place, the affected lines are flushed (if possible) and an approved fixative is applied. The fixative will be applied in accordance with ALARACT 6 "Pit Access" and reapplied as necessary.

   Swipes of the splash guard will be taken during the jumper work. If a used jumper is to be removed from the pit, it is drained and a fixative is applied. If removable contamination is greater than 50,000 dpm/100 cm2 beta/gamma and/or 20 dpm/100 cm2 alpha, the jumper will be contained and/or decontaminated.

   If jumpers are cut, they are cut by hydraulic shears or a portable band saw within the pit. The pieces are contained before they are removed from the pit.

   Pressure Testing Lines:

   A pressure test assembly is installed on the line to be tested in one pit. A blank with a drain is installed on the other end of the line in a separate pit. Temporary and/or permanent covers are placed over the pits during the pressure test.

2. TWRS Facility Description:

   All TWRS facilities

3. 6. TWRS Facility Description:

   * All TWRS facilities (except special nuclear material in 2718-E)

4. 1.Description of Activity/Requirements:

   PREPARATION WORK: A pre-job survey is performed on the exterior surface of the pit and the surrounding area. A fall protection handrail is installed around the pit. The fall protection is draped in plastic sheeting that extends to the top of the pit. This establishes a splash guard around the pit. Before the cover blocks are removed, an approved fixative may be applied inside the pit or the pit may be decontaminated as described below. These processes are generally performed through an access port. If there is no access port(s), the cover blocks are raised and suspended, a radiological survey is performed, and/or a fixative may be applied inside the pit as described in Section 2, Radiological Control. The cover blocks are removed.

   DECONTAMINATION: Uniformly distributed removable contamination levels in the pit are decontaminated/fixed to less than 100,000 dpm/100cm2 beta/gamma and 2,000 dpm/100cm2 alpha by washing and/or an approved fixative is applied to pit surfaces. Fixative will matrix the contamination to ensure minimization of potential airborne contamination. If a high pressure (up to 3,000 psi) or low pressure (approximately 125 psi) whirly is installed, it is done through an opening (if one exists) in the cover blocks and the pit is washed down. The cover blocks are lifted and contained if the removable level is greater than 50,000 dpm/100 cm2 beta/gamma and 20 dpm/100 cm2 alpha. The cover blocks are then moved to a storage area. With the cover blocks off, additional decontamination activities may include the use of chemicals, peel and strip paints, water, or manual scrub brushes. When decontamination activities are complete, other work may begin or a temporary cover is installed over the pit.

CLOSURE: After all activities in the pit are completed, the cover blocks are reinstalled and the splash guard is removed.

5. 2. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* Use of a splash guard extending to the edge of the pit

* Uniformly distributed removable contamination levels within the pit are decontaminated or fixed so that a swipe reads less than 100,000 dpm/100 cm2 beta/gamma and 2,000 dpm/100 cm2 alpha. An approved fixative will be applied to pit surfaces if contamination levels exceed the limits stated above or as needed. Note: The fixative will matrix the contamination to ensure minimization of potential airborne contamination.

* Splash guard will be taped or sealed to the edge of the pit

* Pit work will not be performed if sustained winds are >25 mph

* HPT coverage will be performed as specified in the Radiological Work Permit

6. Monitoring:

* Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

* Swipes will be taken to determine that splash guards are maintain-ed below 50,000 dpm/100 cm2 beta/gamma and 20 dpm/100 cm2 alpha

* Post job survey(s)

7. 3. Monitoring:

* Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

* Swipes will be taken to determine that splash guards are to be maintained below 50,000 dpm/100 cm2 beta/gamma and 20 dpm/100 cm2 alpha

* Post job survey(s)

8. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment and Vehicles" (ALARACT 12)

* A splash guard will extend to the edge of the pit were it is taped or sealed.

* Uniformly distributed removable contamination levels within the pit are decontaminated or fixed so that a swipe reads less than 100,000 dpm/100 cm2 beta/gamma and 2,000 dpm/100 cm2 alpha. An approved fixative will be applied to pit surfaces if contamination levels exceed the limits stated above or as needed. Note: The fixative will matrix the contamination to ensure minimization of potential airborne contamination.

* If a used jumper is to be removed from the pit, it is drained and a fixative is applied. If removable contamination is greater than 50,000 dpm/100 cm2 beta/gamma and/or 20 dpm/100 cm2 alpha, the jumper will be contained and/or decontaminated.

* A temporary or permanent cover is placed over the pit if the pit is ever left unattended

* Pit work will not be performed if sustained winds are >25 mph

* HPT coverage will be performed as specified in the Radiological Work Permit

9. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

10. Emission Pathway:

* Existing active and passive point sources

11. 6. TWRS Facility Description:

* All TWRS Facilities

12. Description of Activity:

Push Mode Core Sampling (PMCS) is conducted with the Rotary Mode Core Sampling (RMCS) System. The RMCS System can operate in either push mode or rotary mode. The preferred mode of RMCS sampling is push mode, which does not involve rotation of the drill string or significant purge gas flow, and is the subject of this ALARACT demonstration. Each RMCS System consists of the sample truck, an optional diesel powered electric generator, an optional in-tank video camera, a pressurized nitrogen supply, and other support equipment. In addition to the three RMCS Systems, there is one PMCS System that operates only in push mode.

Core Sampling system set up and sampling are controlled by operating procedures. Prior to moving the RMCS truck and equipment onto a tank, a walk down is performed. The walk down identifies any physical obstructions/barriers to truck placement and verifies the riser locations. The Core Sampling truck and equipment are then moved to the tank farm for system set up. System set up includes installation of the riser sleeve and riser equipment. This requires that the riser flange cover be removed. Following removal of the riser flange cover, the riser sleeve and riser adapter equipment are installed. This equipment seals against the riser flange, protecting the air pathway. The time between the removal of the flange cover and installation of the riser adapter equipment is kept to the minimum necessary to safely complete the task. HPT coverage is provided the entire time the riser is open.

The operation of core sampling begins by inserting a drill string made up of drill rod sections, into the waste. The first section to be installed is the core barrel in which the core sampler itself is seated. The rotary mode core samplers contain a seal against the bottom of the core barrel. The seal is designed to prevent back flow of tank waste into the drill string. This protects the air pathway out of the tank. The remaining drill rod sections are screwed on to the drill string and inserted into the tank until the starting point for the first core sample segment is reached.

After the first core sample segment has been taken, additional drill string sections and samplers may be added as needed. During push mode sampling, nitrogen gas (or other fluid such as water) is used only in amounts sufficient to maintain the hydrostatic head and prevent or minimize movement of tank waste into the core barrel.

When the segment is complete, the drill string is disconnected from the core sample truck and is capped. The core sampler truck platform is rotated to align and connect the shielded receiving vessel ("shielded receiver") with the drill string. During the connection the air pathway is protected by closed valves on the shielded receiver and on the adapter on the end of the drill string.

When the sampler is removed from the tank, it is placed directly into the shielded receiver without disturbing the air tight seal between the shielded receiver and the drill string. The isolation valves on the shielded receiver and the drill string adapter are closed before disconnecting the shielded receiver from the drill string. The truck platform then rotates to place the shielded receiver either directly over a shipping cask, or the shielded receiver may be positioned over an x-ray machine to allow the sampler to be x-rayed. In either case, the sealed drill string remains in place at the tank riser to maintain the seal to the atmosphere. From the shielded receiver, the sampler is mechanically lowered into a transport cask. Once the sampler is in the transport cask and the shielded receiver has been disconnected, the cask is immediately sealed.

While the sampler is being replaced after each segment, with the RMCS System, nitrogen is injected into the drill string at approximately 0.03 cubic meter per minute. This maintains the hydrostatic head in the drill string, minimizing waste from entering the drill string. This also allows for pressurization and depressurization of the shielded receiver, as necessary, for sampler change out. For the PMCS System, water is used to maintain the hydrostatic head.

Once a complete core has been obtained, the RMCS truck can be repositioned on the same riser or moved to a different riser on the same tank to obtain additional cores. During RMCS breakdown, the drill string is sleeved as it is removed from the tank and placed into a waste container. When sampling is complete at one tank, the RMCS system will be disconnected and moved to the next tank.

* Emission pathway **-** Existing active and passive point sources (Displacement gas used in drill string which is a closed system and has minimal/no emission impact)

* TWRS facility description **-** All SST's, DST's and IMUST's

13. Description of Activity:

Auger sampling represents one technique to remove a sample from tanks which have less than 25 vertical inches of hardened waste material. The auger sampling assembly uses the auger "bit" to obtain a sample of tank waste. Auger sampling equipment consists of an auger "bit", auger rod, auger sleeving assembly, receiving cask, and an on-site transfer cask (OTC).

To begin, a tank riser is opened and the auger adapter sleeving assembly is installed into the tank headspace. The installation of the auger sleeving assembly reduces open riser time. The auger sleeving assembly provides lateral strength to the auger bit and auger rod, and extends from the riser to the top of the waste surface. The receiver cask is then mounted on top of the auger adapter sleeving assembly via a camlock fitting. This camlock fitting seals the receiver cask to the auger adapter assembly which is sealed to the riser, thereby minimizing the open riser time.
The auger rod and auger bit assembly are lowered through the top of the receiver cask assembly, through the

interior of the auger sleeving assembly, down to the surface of the tank waste. The portion of the auger rod extending above the riser is then hand rotated forcing the auger bit to penetrate the tank waste. The tank waste material fills the grooves (flutes) of the auger bit and this constitutes the waste sample.

The auger bit (now containing the sample) and auger rod are pulled up from the tank waste surface, through auger sleeving, and into the receiver cask on top of the riser. During this sample removal step, the auger rod exits the top of the receiver cask into the ambient environment. The auger rod is surveyed for contamination as it is extracted and contained if found to be contaminated. When the auger bit (sample) is within the receiver cask, a ball valve, mounted on the bottom of the receiver cask is closed. The receiver cask is then isolated by placing a temporary cover over the auger rod port.

The receiver cask is moved via crane to the OTC. Once the receiver cask has been connected by a cam lock to the OTC, a handle is connected to the auger bit through the top of the receiver cask and the sample is lowered into the cask. The OTC is sealed and then provides a shipping container for the auger sample.

* Emission pathway - Existing active and passive point sources

* TWRS facility description - All TWRS SST's, DST's and IMUST's

14. Monitoring:

* Radiological surveys (swipes for removable contamination) of work area

* Post job survey(s)

15. Radiological Controls:

* Verify HEPA filtration on receiving tanks

* Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment and Vehicles" (ALARACT 12)

* Follow TWRS ALARACT demonstration for "Installation and Removal of Equipment from Tanks" (ALARACT 13)

* Follow TWRS ALARACT demonstration for "Pit Work" (ALARACT 14)

16. Monitoring:

* Radiological surveys (swipes for removable contamination) of work area

* Post job survey(s)

17. Emission Pathway:

* Existing active and passive point sources and fugitive non-point sources

18. 1. Description of Activity/Requirements:

Size reducing, cutting or disassembling contaminated material and equipment for more economical waste packaging. Contaminated devices are employed as applicable per the contaminated guideline matrix. The process is limited to mechanical cutting techniques such as low speed and high speed sawing, snipping, shearing, as well as hot work such as cutting torches. The process will also include bending, crimping, and compaction to preclude the need for cutting operations.

Examples of items cut up or disassembled for waste disposal during facility operations include long length contaminated equipment, (i.e. waste tank level instrumentation, thermocouple trees, specific gravity probes, observation ports, hose and piping) waste sampling equipment, (i.e. drill strings or augers) pumps, compressors and deactivated exhausters with associated ductwork. This includes replacement and disposal of flexible ventilation ductwork located upstream of HEPA filtration.

19. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

20. 5. Emission Pathway:

* Existing passive non-point sources

21. Locations:

* All TWRS facilities

* This ALARACT demonstration applies to all pits except 241-ER-152, 241-S-151, 241-UX-154, 241-TX-154, 244-CR Vault DCRT, 244-A Lift Station DCRT, and 244-TX DCRT.

22. 2. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* Equipment with removable contamination will be contained per the containment guideline matrix from HNF-IP-0842 or decontaminated.

* HPT coverage as specified in the Radiological Work Permit

23. 4. Records/Documentation:

* Radiological work permit

* Radiological survey report(s)

24. Records/Documentation:

* Radiological survey report(s)

* Radiological work permit

25. Monitoring:

* Radiological surveys (swipes for removable contamination) of work area

* Post job survey(s)

26. Emission Pathway:

* Existing passive non-point sources

27. Monitoring:

* Radiological surveys (swipes for removable contamination) of work area

* Post job survey(s)

28. TWRS Facility Description:

* All TWRS SST's, DST's, and IMUSTs

29. 5. Emission Pathway:

* Active and passive, point sources and fugitive sources

30. Monitoring:

* Radiological surveys (swipes for removable contamination) of work area

* Post job survey(s)

31. Monitoring:

* Radiological surveys (swipes for removable contamination) of work area

* Post job survey

32. 3. Monitoring:

* Radiological surveys

* Post job survey(s)

33. 4. Emission Pathway:

* Active and passive, point sources and fugitive sources

34. Monitoring:

* Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

* Post job survey(s)

35. 6. TWRS Facility Description:

* Pits at all TWRS facilities

* This ALARACT demonstration applies to all pits except 241-ER-152, 241-S-151, 241-UX-154, 241-TX-154, 244-CR Vault DCRT, 244-A Lift Station DCRT, and 244-TX DCRT.

36. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* HPT coverage will be performed as specified in the Radiological Work Permit

* Verify passive or active HEPA filtration on tanks

* The LDUA TRIC will not be set up or removed if sustained winds are >25 mph

* Riser isolation valve minimizes open riser time

* HEPA-type filter equipped TRIC. The HEPA-type filter is tested by the manufacturer and used once per tank evolution.

* VPM Housing

37. Description of Activity/Requirements:

The Light Duty Utility Arm is a long robotic manipulator arm that is installed, operated, and removed in waste tanks through existing tank risers. A variety of tools (called 'end effectors') can be installed on the end of the arm to perform activities such as: sampling waste materials, tank surveillance and inspections, manipulating in-tank equipment, and performing in-tank analysis of waste properties. The end effectors may be locally waste disturbing near the waste surface (up to 12 inches deep) by probing, scraping, grabbing or sampling tank waste at various locations within the tank. In addition, the end effectors may be used to place monitoring equipment onto or into tank waste.

The manipulator arm is maintained in a housing on a truck that transports the equipment. The truck contains equipment for vertical and horizontal positioning of the arm and housing. The manipulator arm, housing, and positioning equipment is collectively called the Vertical Positioning Mast (VPM).

The riser is opened per ALARACT 1 and a riser isolation valve is installed. The VPM is connected to the riser isolation valve with the Tank Riser Interface and Confinement (TRIC) system. The TRIC provides radiological confinement when the riser isolation valve is open. The TRIC contains gloved ports for hands-on activities, access to change end effectors, and to allow vapor sampling. The TRIC is equipped with a HEPA-type filter.

A decontamination system provides for gross removal of external contamination from the mast, arm, and end effector. The decontamination system is attached to the bottom of the confinement enclosure. The decontamination system sprays a ring of water through which the mast, arm, and end effector are withdrawn from the tank and into the housing of the VPM.

When the LDUA is operated in a waste tank, a purge system provides a constant low volume flow of instrument grade air into the LDUA, VPM, and any end effectors. The purge air creates a positive pressure inside the system. This is required for operation in flammable gas environments and also minimizes radioactive contamination from entering the in-tank components. The purge gas exits through the TRIC HEPA-type filter or the tank ventilation system.

38. 4. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

39. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* HPT coverage will be performed as specified in the radiological work permit.

* A beta-gamma survey of the ground surface is required prior to excavation in Contamination Areas (CA's), High Contamination Areas (HCA's), Soil Contamination Areas (SCA's), and Underground Radioactive Material Areas (URMA's). An alpha survey may be required prior to excavation per the "Justification for Dual Survey Exemption in Tank Farm Facilities" HNF-3391.

* For excavation in CA's, HCA's, SCA's, and URMA's, if beta-gamma activity greater than 1000 dpm/probe area (5000 dpm/100cm2) is identified, alpha surveys will also be performed.

* Suppressants such as water, fixatives, covers, or windscreens will be used as necessary, including at the end of each shift or when sustained or predicted winds are >20mph.

* If the net alpha for the general area is greater than 140 dpm/probe area, OR if the net beta-gamma activity for the general area is greater than 500,000 dpm/probe area, work will be suspended and worker safety evaluated by TWRS Radiological Control. Direct contact will also be made to WDOH. After it is determined that there is no threat to worker safety, WDOH has been contacted, and the proper controls (e.g., water fixatives, covers, windscreens) have been put in place, excavation may continue.
A contact of WDOH will not be needed if the contamination consists of a hot speck. If hot specks are detected during the radiological surveys, the specks will be removed and contained before the activity is allowed to continue unless located in the bottom of the trench after excavation has been completed. Specks found in the bottom of the completed trench may be covered with clean fill. A hot speck will be defined as a very small amount (i.e. less than or equal to 100 cm2) of contamination reading greater than or equal to 1,000,000 dpm/probe size beta-gamma and/or greater than or equal to 490 dpm/probe size alpha.

40. Records/Documentation:

Work package

Radiological work permit

Radiological survey report(s)

41. Description of Activity/Requirements:

Soil is routinely excavated in the TWRS facilities to support riser preparation, repair and maintenance activities, soil sampling, cleanup of contamination, removal of vegetation and biological hazards, and operational activities (laying conduit or cables for power). An initial survey is performed of the area to be excavated. Surveys are performed throughout the excavation to assure that worker safety and environmental protection is maintained. Once the excavation begins, water is used, as necessary, to prevent the spread of dust. To the extent practicable using hand held instrument field survey techniques, the clean soil is separated from the soil identified as contaminated. The contaminated soil has a fixative applied or is covered by plastic at the end of the shift, and as necessary, to stabilize the contaminated soil. The activities covered by this ALARACT demonstration do not include D&D. All radioactively contaminated soil excavation is conducted using hand tools.

42. Description on Activity/Requirements:

This ALARACT demonstration does not provide approval for the following activities: waste sampling, sluicing, lancing, operations of mixer pumps, and use of the LDUA. While operating under these activities, the applicable ALARACT demonstrations must be complied with.

A multitude of equipment may be installed, operated, and removed from tanks (actively and passively ventilated).

When installing and removing equipment from tanks, risers and pits are opened. ALARACT 1 (Riser Preparation/Opening) and ALARACT 6 (Pit Access) describe the activities necessary to prepare the risers and pits.

If water lancing is performed to assist in the installation of equipment, it will be done in accordance with ALARACT 10 (Water Lancing).

Equipment is lowered into and removed from tanks either manually or remotely (e.g. using a crane). Once the equipment is installed, mating surfaces of the equipment and riser are sealed.

All equipment removed from tanks is contained using glovebags, sleeving, or other containment devices in accordance with the latest revision of the containment matrix guide from HNF-IP-0842.

The riser is closed under ALARACT 1 (Riser Preparation/Opening) and the pit is closed under ALARACT 6 (Pit Access) following installation or removal of equipment.

Waste is packaged and transported per ALARACT 4 (Packaging and Transportation of Waste). Equipment is packaged and transported per ALARACT 12 (Packaging and Transportation of Equipment and Vehicles).

43. Description of Activity:

Risers may have screw caps, blind flanges, shield plugs, or equipment installed in them. Preparation may include the following:

Screw caps: A pre-work survey is completed of the riser and the area around the riser. Soil covering is installed around the riser. If the riser or screw cap is highly contaminated, a glove bag may be installed to control contamination spread. Slight contamination is wiped off the riser with damp rags.

Blind flanges: A pre-work survey is completed of the riser and the immediate work area around the riser, a glove bag may be used to contain the blind flange during removal. Slight contamination is removed with damp rags.

Shield plugs and other equipment to be removed from risers: Risers may have various types of equipment installed. The equipment will be installed and removed per ALARACT 13. To open the riser, it will be necessary to remove the equipment. A pre-work survey is completed of the riser, installed equipment, and the area around the riser. Soil covering is installed around the risers. If necessary, glove bags or sleeving may be used on smaller pieces of equipment to be removed. Larger items may require the need for a windbreak or containment tent.

When the riser is opened, Industrial Hygiene samples may be taken.

All containments used are in accordance with the containment matrix guide found in HNF-IP-0842, latest revision.

Soil covering may be of a material such as, plastic sheeting, rubber matting, foil backed paper, griflon, or any material which will prevent possible contamination from reaching the soil.

The riser will be closed after all riser activities are completed.

* Emission Pathway - Existing active and passive point sources

* TWRS Facility Description - All TWRS facilities

44. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Size Reduction of Waste Equipment for Disposal" (ALARACT 15)

* Double contained and closed (At a minimum)

* <1,000 dpm/100cm2 beta/gamma on the outer-most container

* <20 dpm/100cm2 alpha on the outer-most container (Unless exempted by the latest revision of the "Justification for Dual Survey Exemption in Tank Farm Facilities," HNF-3391)

* Use approved containment guideline matrix from HNF-IP-0842, latest revision

* HPT coverage will be performed as specified in the Radiological Work Permit

45. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

46. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* HPT coverage will be performed as specified in the Radiological work permit

* Use riser adapter to minimize open riser time

* Verify passive or active HEPA filtration on tanks

* HEPA-type filtration in sample line

* Contain contaminated equipment

* Sample contained when in shipping container

47. Records/Documentation:

* Radiological work permit

* Radiological survey report(s)

48. Description of Activity/Requirements:

Wastes are transferred to, from, and within actively ventilated tank farm storage facilities (i.e. double-shell tanks), chemical processing facilities, receiver vaults, mobile tanks, and evaporators. Wastes are also transferred from single-shell tanks during (and due to) salt well pumping. Transfers are made through a network of existing or to be installed above or below ground pipelines, operating equipment. Transfers also utilize the existing network of controls or transfer structures (currently in use, or constructed under a Notice of Construction) such as diversion boxes, valve pits, double contained receiver tanks, and diverter stations.

Jet, submersible, or transfer pumps are used to transfer waste at flow rates up to 300 gallons (1,132 liters) per minute. The cover blocks are reinstalled on the pits before starting any waste transfer operation.

Occasionally, water is added to a tank or transfer system to prevent or remove plugs. Other techniques to free blockages include chemical flushing, pressurization, temporary jumpers, hydraulic scouring, and the use of heat tracing. Flow rates and pressures used are determined by engineering evaluations. Flow into the sending/receiving tank is exhausted using a HEPA filtered vent.

49. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* Follow TWRS ALARACT demonstration for "Installation, Operation, and Removal of Equipment (ALARACT 13)

* Pre-job survey is performed

* Use approved containment guideline matrix from
HNF-IP-0842, latest revision

* Do not open risers if sustained winds are >25 mph

* Open riser time will be minimized

* HPT coverage will be performed as specified in the Radiological Work Permit

50. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

51. Description of Activity:

There are two methods to collect vapor samples from waste tanks: grab sampling (with SUMMA canisters), and In-Situ Vapor Sampling (ISVS or Type IV) equipment. SUMMA is an evacuated container. Other equivalent evacuated containers may be used in its place.

SUMMA VAPOR SAMPLING

SUMMA sampling equipment consists of a riser adapter (not used for drill string vapor samples), sample tubing, and SUMMA canisters.

To begin SUMMA sampling, a tank riser is opened and the riser adapter is installed. The riser adapter contains sampling tubes that extend above the top of the riser and continue down into the tank headspace. The sampling tubes are fitted with isolation valves. An installed riser adapter with the sample tube valve closed isolates the tank vapor space from the ambient environment.

In the first step, the sampling tube is purged using portable industrial hygiene instruments and the headspace vapor is drawn into the tube. A tank headspace sample is collected by attaching a SUMMA canister to the top end of a sampling tube and opening the valve. The SUMMA canister, an evacuated container, allows the tank headspace gas to be pulled into the container. The self-contained sample canister is shipped to a laboratory for analysis.

When vapor sampling is finished, the riser adapter/tubing assembly is removed, surveyed by an HPT, and placed into containment sleeving if found contaminated. If a riser is used, a cap or flange is then installed.

TYPE IV VAPOR SAMPLING

The second method of vapor sampling is the In-Situ Vapor sampling (ISVS or Type IV sampling) method. Contrasting SUMMA grab sampling, ISVS sample media is directly exposed to tank vapor gases by placement in the tank headspace. The ISVS sampling equipment consists of a riser adapter, an air pump mounted on a handcart, a manifold for connecting sample tubing, tube bundle assembly which has a sampling head containing the sample media, and the sample media.

The sampling begins by opening a tank riser designated for sampling; installing the riser adapter; inserting the plastic sleeved sample tubes (with the sampling head/media attached) into the riser to the required sampling depth; attaching the sample tubes to the air pump handcart; sampling for a period of time; removal of the sample lines and sample media; removal of the riser adapter and closing the riser; packaging the samples for shipment to a laboratory; packaging waste for eventual disposal.

* Emission pathway - Existing active and passive point sources

*TWRS facility description - All TWRS SST's, DST's and IMUST's

52. Monitoing:

* Radiological surveys (direct surveys of soil)

* Post job survey(s)

53. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

54. Records/Documentation:

* Flow rate and pressure engineering evaluations

* Work package

* Radiological work permit

* Radiological survey report(s)

55. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

56. Monitoring:

* Radiological surveys (swipes for removable contamination) of work area

* Post job survey

57. Radiological Controls:

Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6)

Follow TWRS ALARACT demonstration for "Water Lancing" (ALARACT 10)

Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment and Vehicles" (ALARACT 12)

Follow TWRS ALARACT demonstration for "Size Reduction of Waste Equipment for Disposal" (ALARACT 15)

Equipment is decontaminated or contained when removed from tanks

Swipes will be taken to determine that the surface of the item or the outermost surface of the container are maintained <50,000 dpm/100cm2 beta/gama and/or <20 dpm/ 100cm2 alpha

HPT coverage will be performed as specified in the Radiological Work Permit

Do not install or remove equipment if sustained winds are >25 mi/hr

When containment is used, it will be in accordance with the latest revision of the containment matrix guide from HNF-IP-0842.

58. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

59. Radiological Controls:

Removable contamination on the surface of the item, or the outer-most container, must be <1,000 dpm/100cm2 beta/gamma and/or <20 dpm/100cm2 alpha if the equipment or vehicle is leaving the contamination area

60. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

61. Emission Pathway:

Existing passive or active point & non-point sources

62. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6), if applicable

* HPT coverage will be performed as specified in the Radiological Work Permit

* Do not initiate sampling if sustained winds are >25 mph

* Use riser adapter to minimize open riser time

* Samples contained prior to placement in a shielded container

* Sample contained when in shipping cask

* Contain contaminated equipment

* Use approved containment guideline matrix from HNF-IP-0842, latest revision

63. Description of Activity:

Some materials become contaminated during work conducted within all TWRS facilities. Such contaminated materials, which are not released or otherwise controlled, are handled as radioactive waste. Radioactive waste generated from Tank Farms operations activities such as pit work, excavations, surveillances, housekeeping, maintenance and tank sampling, will be double contained at a minimum. Some contaminated equipment may be reduced in size by cutting, sawing, snipping, shearing, or disassembling as appropriate for more economical waste packaging. A radiological survey is conducted prior to storage or transportation of the outer-most container to verify that removable contamination meets the requirements under the Radiological Controls section.

* Emission pathway - Existing passive point sources

* TWRS facility description - All TWRS facilities (Except special nuclear material in 2718-E)

64. Description of Activity:

Water lancing the waste in an underground storage tank is performed to determine the depth of the tank from the riser location and to prepare for equipment installation, such as salt well screens, jet pump assemblies and liquid observation wells. There are two types of water lances:

a) A long pipe approximately 7.62 cm in diameter with a single nozzle at the end. This design uses hot water (supplied by a truck) at low pressure, approximately 1034 kilopascals (150 psi). Use of this design may require the lance to be raised and lowered into the waste multiple times so that a large enough hole can be formed in the waste to accommodate the equipment to be installed in the hole.

b) A newer design lance has a 28 cm diameter pipe and multiple nozzles on the bottom to facilitate waste penetration. It is designed to create a large hole with one insertion of the lance into the waste. This design requires less (hot) water volume and operates at higher pressure, 20685 kilopascals (3000 psi).

In each case, a hose from a water truck is connected to the top end of the water lance. The water lance is inserted into a tank riser which has a water spray ring mounted within the riser. Additionally, a plastic sleeve is staged and tied off at the top of the lance for deployment during lance retrieval. During insertion of the water lance, air emissions are controlled by the use of the water spray ring. The water spray ring sprays water in the annulus between the outside diameter of the water lance and the inside diameter of the riser. The water lance is lowered until it penetrates the solid portions of the waste which need to be broken up to allow insertion of the saltwell screen or other equipment. The water lance withdrawal steps are the reverse of the insertion sequence. The water spray ring is used to wash radioactive tank waste from the outside of the water lance. Hand wiping of the lance may also take place immediately above the riser and below the plastic sleeving. Washing is repeated until radiation readings are <100 mrem/hr. If the lance cannot be decontaminated below 100 mrem/hr, the lance will be sleeved in plastic, removed from the tank, and stored. The pit or riser will be closed.

Contingency plans within the scope of this ALARACT demonstration are:

a) Removing the lance from the tank for further decontamination by washing, wiping or brushing. The activities will be conducted in accordance with the containment matrix guide found in HNF-IP-0842, latest revision.
Rev. 0
b) Replacement of contaminated parts if they cannot be adequately decontaminated as noted in (a) above. This activity will be conducted in accordance with the containment matrix guide found in HNF-IP-0842, latest revision.

c) Packaging, storing and transporting the lance "as is" if the external dose rates exceed 100 mrem/hr.

As the water lance is withdrawn from the tank, it is placed inside a plastic sleeve (during the withdrawal process), surveyed, and stored until its next use.

The actual water lancing time (residence time in waste) usually ranges from 10 minutes to 4 hours with an average time of about 30 minutes. Riser open time is minimized.

* Emission pathway - Existing active and passive point sources

* TWRS facility description - All TWRS SST's, DST's, and IMUSTs

65. TWRS Facility Description:

* All TWRS facilities

66. Monitoring:

* Radiological surveys (swipes for removable contamination) of work area

* Post job survey(s)

67. Radiological Controls:

* When opening riser, use TWRS ALARACT demonstration controls for "Riser Preparation/Opening" (ALARACT 1)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* HPT coverage will be performed as specified in the Radiological Work Permit

* Do not initiate sampling activities if sustained winds are >25 mph

* Valves, caps, plugs, used to minimize open riser time

* Core sampler seal in place

* Threaded connections and/or cam-locks

* Verify passive or active HEPA filtration on tanks

* Use approved containment guideline matrix from HNF-IP-0842, latest revision

68. Monitoring:

* Process parameters monitored include tank pressure alarms and annulus and primary tank exhaust CAMs.

* Record samplers

* Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

* Post job survey(s)

69. TWRS Facility Description:

* All TWRS facilities

70. Emission Pathway:

* Existing passive (fugitive/diffuse)

71. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* HPT coverage will be performed as specified in the Radiological Work Permit

* Do not initiate auger sampling if sustained winds are >25 mph

* Use valves, caps, and plugs to minimize open riser time

* Cam locks used to secure receiving cask to riser and shipping cask

* Verify passive or active HEPA filtration on tanks

* Contain contaminated equipment

* Temporary cover placed on top of receiving cask

* Sample contained when in shipping cask

72. Description of Activity:

Grab sampling is used to obtain small volume samples of tank waste materials. Individual samples are typically <1 liter, but multiple samples can be taken from the tank. The sampled material consists of liquid, sludges, and solids. Grab sampling techniques are suitable for relatively soft waste. If the waste material is too thick or hard, other sampling techniques (such as core sampling) may be required.

Grab samples are acquired through tank risers. A riser is prepared for grab sampling by first installing a riser adapter called a 'top hat'. The top hat acts as a temporary seal for the open riser to minimize open riser time. The next step is to install a glove bag over the tank riser.

The sampling assembly consists of a sample device suspended on a wire cable. The most commonly used sample devices are a bottle in a weighted bottle holder, and a finger sampler. The bottle is used when the waste material is primarily liquid, while the finger sampler is used to sample relatively solid material.

The sample assembly is placed into the glovebag, the glovebag is closed and the riser is opened. The sample device is lowered with a hand operated winch, the waste sample collected, and retrieved from the tank. If the collected sample is a bottle, the bottled is capped, bagged and placed into a shielded container. If the sample is collected in a finger sampler, the waste is transferred to a secondary container, bagged and placed into the shielded container. The shielded container with the waste sample is then transferred outside the glovebag through an ante-chamber. The glovebag ante-chamber isolates the open riser during sample transfer.

When sampling is finished, the glove bag is collapsed, venting air through a small HEPA type filter, and all contaminated sampling equipment contained inside is disposed as waste.

A small percentage of grab sampling jobs are performed on top of a tank riser without a glovebag. An example would be raising a saltwell pump (accessed from within a pit) and sampling between the pump legs and the saltwell screen. Such sample jobs are controlled through work planning utilizing the Radiological Control Containment Guide Matrix (contained in HNF-IP-0842, latest revision).

* Emission pathway - Existing active and passive point sources

* TWRS facility description - All TWRS SST's, DST's and IMUST's

73. Records/Documentation:

* Work package

* Radiological work permit

* Radiological survey report(s)

74. Radiological Controls:

* Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

* Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6), if applicable

* Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment" (ALARACT 12)

* During insertion and removal, radionuclide control is achieved by spraying the annulus between the lance outside diameter and riser inside diameter with water.

* Verify passive or active HEPA filtration on tanks

* Use approved containment guideline matrix from HNF-IP-0842, latest revision

* HPT coverage will be performed as specified in the Radiological Work Permit

75. Monitoring:

Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

Post job survey(s)

76. Description of Activity:

* Equipment and vehicles that become contaminated during work activities are reused when possible. If the equipment or vehicle is to be reused or stored in a contamination area, the removable activity levels on the surface of the item, or the outer-most container, must be in accordance with HSRCM-1, Table 2-4 (or latest revision). If the equipment or vehicle is to be transported to another facility, the surface of the item, or the outermost container, must meet the requirements under the Radiological Controls section listed below.

* Emission pathway - Fugitive/diffuse sources

* TWRS Facility Description - All TWRS facilities

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR INSTALLATION, OPERATION, AND REMOVAL OF TANK EQUIPMENT	HNF-4327, Rev. 0c		433

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. TWRS Facility Description:

   All TWRS facilities

2. Emission Pathway:

   Existing passive or active point & non-point sources

3. Records/Documentation:

   Work package

   Radiological work permit

   Radiological survey report(s)

4. Monitoring:

   Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

   Post job survey(s)

5. Radiological Controls:

   Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

   Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6)

   Follow TWRS ALARACT demonstration for "Water Lancing" (ALARACT 10)

   Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment and Vehicles" (ALARACT 12)

   Follow TWRS ALARACT demonstration for "Size Reduction of Waste Equipment for Disposal" (ALARACT 15)

   Equipment is decontaminated or contained when removed from tanks

   Swipes will be taken to determine that the surface of the item or the outermost surface of the container are maintained <50,000 dpm/100cm2 beta/gama and/or <20 dpm/ 100cm2 alpha

   HPT coverage will be performed as specified in the Radiological Work Permit

   Do not install or remove equipment if sustained winds are >25 mi/hr

   When containment is used, it will be in accordance with the latest revision of the containment matrix guide from HNF-IP-0842.

6. Description on Activity/Requirements:

This ALARACT demonstration does not provide approval for the following activities: waste sampling, sluicing, lancing, operations of mixer pumps, and use of the LDUA. While operating under these activities, the applicable ALARACT demonstrations must be complied with.

A multitude of equipment may be installed, operated, and removed from tanks (actively and passively ventilated).

When installing and removing equipment from tanks, risers and pits are opened. ALARACT 1 (Riser Preparation/Opening) and ALARACT 6 (Pit Access) describe the activities necessary to prepare the risers and pits.

If water lancing is performed to assist in the installation of equipment, it will be done in accordance with ALARACT 10 (Water Lancing).

Equipment is lowered into and removed from tanks either manually or remotely (e.g. using a crane). Once the equipment is installed, mating surfaces of the equipment and riser are sealed.

All equipment removed from tanks is contained using glovebags, sleeving, or other containment devices in accordance with the latest revision of the containment matrix guide from HNF-IP-0842.

The riser is closed under ALARACT 1 (Riser Preparation/Opening) and the pit is closed under ALARACT 6 (Pit Access) following installation or removal of equipment.

Waste is packaged and transported per ALARACT 4 (Packaging and Transportation of Waste). Equipment is packaged and transported per ALARACT 12 (Packaging and Transportation of Equipment and Vehicles).

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR PIT WORK	HNF-4327, Rev. 0		354

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. Locations:

   * All TWRS facilities

   * This ALARACT demonstration applies to all pits except 241-ER-152, 241-S-151, 241-UX-154, 241-TX-154, 244-CR Vault DCRT, 244-A Lift Station DCRT, and 244-TX DCRT.

2. Emission Pathway:

   * Existing passive non-point sources

3. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

4. Monitoring:

   * Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

   * Swipes will be taken to determine that splash guards are maintain-ed below 50,000 dpm/100 cm2 beta/gamma and 20 dpm/100 cm2 alpha

   * Post job survey(s)

5. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Equipment and Vehicles" (ALARACT 12)

   * A splash guard will extend to the edge of the pit were it is taped or sealed.

   * Uniformly distributed removable contamination levels within the pit are decontaminated or fixed so that a swipe reads less than 100,000 dpm/100 cm2 beta/gamma and 2,000 dpm/100 cm2 alpha. An approved fixative will be applied to pit surfaces if contamination levels exceed the limits stated above or as needed. Note: The fixative will matrix the contamination to ensure minimization of potential airborne contamination.

   * If a used jumper is to be removed from the pit, it is drained and a fixative is applied. If removable contamination is greater than 50,000 dpm/100 cm2 beta/gamma and/or 20 dpm/100 cm2 alpha, the jumper will be contained and/or decontaminated.

* A temporary or permanent cover is placed over the pit if the pit is ever left unattended

* Pit work will not be performed if sustained winds are >25 mph

* HPT coverage will be performed as specified in the Radiological Work Permit

6. Description of Activity/Requirements:

When entering or exiting the pit, ALARACT 6 "Pit Access" must be complied with.

All equipment removed from the pit is decontaminated or contained. A temporary or permanent cover is placed over the pit if ever left unattended.

Installing pit leak detectors, unplugging drains, and housekeeping/waste removal activities are performed following the above description.

Specific activities performed in pits follows:

Jumper Work:

Before any jumper work takes place, the affected lines are flushed (if possible) and an approved fixative is applied. The fixative will be applied in accordance with ALARACT 6 "Pit Access" and reapplied as necessary.

Swipes of the splash guard will be taken during the jumper work. If a used jumper is to be removed from the pit, it is drained and a fixative is applied. If removable contamination is greater than 50,000 dpm/100 cm2 beta/gamma and/or 20 dpm/100 cm2 alpha, the jumper will be contained and/or decontaminated.

If jumpers are cut, they are cut by hydraulic shears or a portable band saw within the pit. The pieces are contained before they are removed from the pit.

Pressure Testing Lines:

A pressure test assembly is installed on the line to be tested in one pit. A blank with a drain is installed on the other end of the line in a separate pit. Temporary and/or permanent covers are placed over the pits during the pressure test.

7. 6. TWRS Facility Description:

* All TWRS Facilities

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR PACKAGING AND TRANSPORTATION OF WASTE, Rev. 0c	HNF-4327, Rev. 0c		431

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. 6. TWRS Facility Description:

   * All TWRS facilities (except special nuclear material in 2718-E)

2. 4. Emission Pathway:

   * Active and passive, point sources and fugitive sources

3. Records/Documentation:

   * Radiological survey report(s)

   * Radiological work permit

4. Monitoring:

   * Radiological surveys (swipes for removable contamination) of work area

   * Post job survey(s)

5. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Size Reduction of Waste Equipment for Disposal" (ALARACT 15)

   * Double contained and closed (At a minimum)

   * <1,000 dpm/100cm2 beta/gamma on the outer-most container

   * <20 dpm/100cm2 alpha on the outer-most container (Unless exempted by the latest revision of the "Justification for Dual Survey Exemption in Tank Farm Facilities," HNF-3391)

   * Use approved containment guideline matrix from HNF-IP-0842, latest revision

   * HPT coverage will be performed as specified in the Radiological Work Permit

6. Description of Activity:

   Some materials become contaminated during work conducted within all TWRS facilities. Such contaminated materials, which are not released or otherwise controlled, are handled as radioactive waste. Radioactive waste generated from Tank Farms operations activities such as pit work, excavations, surveillances, housekeeping, maintenance and tank sampling, will be double contained at a minimum. Some contaminated equipment may be reduced in size by cutting, sawing, snipping, shearing, or disassembling as appropriate for more economical waste packaging. A radiological survey is conducted prior to storage or transportation of the outer-most container to verify that removable contamination meets the requirements under the Radiological Controls section.

   * Emission pathway - Existing passive point sources

   * TWRS facility description - All TWRS facilities (Except special nuclear material in 2718-E)

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR SOIL EXCAVATION (USING HAND TOOLS)	HNF-4327, Rev. 0		345

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. TWRS Facility Description:

   * All TWRS facilities

2. Emission Pathway:

   * Existing passive (fugitive/diffuse)

3. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

4. Monitoing:

   * Radiological surveys (direct surveys of soil)

   * Post job survey(s)

5. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * HPT coverage will be performed as specified in the radiological work permit.

   * A beta-gamma survey of the ground surface is required prior to excavation in Contamination Areas (CA's), High Contamination Areas (HCA's), Soil Contamination Areas (SCA's), and Underground Radioactive Material Areas (URMA's). An alpha survey may be required prior to excavation per the "Justification for Dual Survey Exemption in Tank Farm Facilities" HNF-3391.

   * For excavation in CA's, HCA's, SCA's, and URMA's, if beta-gamma activity greater than 1000 dpm/probe area (5000 dpm/100cm2) is identified, alpha surveys will also be performed.

   * Suppressants such as water, fixatives, covers, or windscreens will be used as necessary, including at the end of each shift or when sustained or predicted winds are >20mph.

   * If the net alpha for the general area is greater than 140 dpm/probe area, OR if the net beta-gamma activity for the general area is greater than 500,000 dpm/probe area, work will be suspended and worker safety evaluated by TWRS Radiological Control. Direct contact will also be made to WDOH. After it is determined that there is no threat to worker safety, WDOH has been contacted, and the proper controls (e.g., water fixatives, covers, windscreens) have been put in place, excavation may continue.
   A contact of WDOH will not be needed if the contamination consists of a hot speck. If hot specks are detected during the radiological surveys, the specks will be removed and contained before the activity is allowed to continue unless located in the bottom of the trench after excavation has been completed. Specks found in the bottom of the completed trench may be covered with clean fill. A hot speck will be defined as a very small amount (i.e. less than or equal to 100 cm2) of contamination reading greater than or equal to 1,000,000 dpm/probe size beta-gamma and/or greater than or equal to 490 dpm/probe size alpha.

6. Description of Activity/Requirements:

Soil is routinely excavated in the TWRS facilities to support riser preparation, repair and maintenance activities, soil sampling, cleanup of contamination, removal of vegetation and biological hazards, and operational activities (laying conduit or cables for power). An initial survey is performed of the area to be excavated. Surveys are performed throughout the excavation to assure that worker safety and environmental protection is maintained. Once the excavation begins, water is used, as necessary, to prevent the spread of dust. To the extent practicable using hand held instrument field survey techniques, the clean soil is separated from the soil identified as contaminated. The contaminated soil has a fixative applied or is covered by plastic at the end of the shift, and as necessary, to stabilize the contaminated soil. The activities covered by this ALARACT demonstration do not include D&D. All radioactively contaminated soil excavation is conducted using hand tools.

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR TANK WASTE GRAB SAMPLING	HNF-4327, Rev. 0		305

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

2. Monitoring:

   * Radiological surveys (swipes for removable contamination) of work area

   * Post job survey(s)

3. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * Follow TWRS ALARACT demonstration for "Pit Access" (ALARACT 6), if applicable

   * HPT coverage will be performed as specified in the Radiological Work Permit

   * Do not initiate sampling if sustained winds are >25 mph

   * Use riser adapter to minimize open riser time

   * Samples contained prior to placement in a shielded container

   * Sample contained when in shipping cask

   * Contain contaminated equipment

   * Use approved containment guideline matrix from HNF-IP-0842, latest revision

4. Description of Activity:

   Grab sampling is used to obtain small volume samples of tank waste materials. Individual samples are typically <1 liter, but multiple samples can be taken from the tank. The sampled material consists of liquid, sludges, and solids. Grab sampling techniques are suitable for relatively soft waste. If the waste material is too thick or hard, other sampling techniques (such as core sampling) may be required.

   Grab samples are acquired through tank risers. A riser is prepared for grab sampling by first installing a riser adapter called a 'top hat'. The top hat acts as a temporary seal for the open riser to minimize open riser time. The next step is to install a glove bag over the tank riser.

   The sampling assembly consists of a sample device suspended on a wire cable. The most commonly used sample devices are a bottle in a weighted bottle holder, and a finger sampler. The bottle is used when the waste material is primarily liquid, while the finger sampler is used to sample relatively solid material.

   The sample assembly is placed into the glovebag, the glovebag is closed and the riser is opened. The sample device is lowered with a hand operated winch, the waste sample collected, and retrieved from the tank. If the collected sample is a bottle, the bottled is capped, bagged and placed into a shielded container. If the sample is collected in a finger sampler, the waste is transferred to a secondary container, bagged and placed into the shielded container. The shielded container with the waste sample is then transferred outside the glovebag through an ante-chamber. The glovebag ante-chamber isolates the open riser during sample transfer.

When sampling is finished, the glove bag is collapsed, venting air through a small HEPA type filter, and all contaminated sampling equipment contained inside is disposed as waste.

A small percentage of grab sampling jobs are performed on top of a tank riser without a glovebag. An example would be raising a saltwell pump (accessed from within a pit) and sampling between the pump legs and the saltwell screen. Such sample jobs are controlled through work planning utilizing the Radiological Control Containment Guide Matrix (contained in HNF-IP-0842, latest revision).

* Emission pathway - Existing active and passive point sources

* TWRS facility description - All TWRS SST's, DST's and IMUST's

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR VAPOR SAMPLING	HNF-4327, Rev. 0		306

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)
2. Monitoring:

   * Radiological surveys (swipes for removable contamination) of work area

   * Post job survey(s)
3. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * HPT coverage will be performed as specified in the Radiological work permit

   * Use riser adapter to minimize open riser time

   * Verify passive or active HEPA filtration on tanks

   * HEPA-type filtration in sample line

   * Contain contaminated equipment

   * Sample contained when in shipping container
4. Description of Activity:

   There are two methods to collect vapor samples from waste tanks: grab sampling (with SUMMA canisters), and In-Situ Vapor Sampling (ISVS or Type IV) equipment. SUMMA is an evacuated container. Other equivalent evacuated containers may be used in its place.

   SUMMA VAPOR SAMPLING

   SUMMA sampling equipment consists of a riser adapter (not used for drill string vapor samples), sample tubing, and SUMMA canisters.

   To begin SUMMA sampling, a tank riser is opened and the riser adapter is installed. The riser adapter contains sampling tubes that extend above the top of the riser and continue down into the tank headspace. The sampling tubes are fitted with isolation valves. An installed riser adapter with the sample tube valve closed isolates the tank vapor space from the ambient environment.

   In the first step, the sampling tube is purged using portable industrial hygiene instruments and the headspace vapor is drawn into the tube. A tank headspace sample is collected by attaching a SUMMA canister to the top end of a sampling tube and opening the valve. The SUMMA canister, an evacuated container, allows the tank headspace gas to be pulled into the container. The self-contained sample canister is shipped to a laboratory for analysis.

When vapor sampling is finished, the riser adapter/tubing assembly is removed, surveyed by an HPT, and placed into containment sleeving if found contaminated. If a riser is used, a cap or flange is then installed.

TYPE IV VAPOR SAMPLING

The second method of vapor sampling is the In-Situ Vapor sampling (ISVS or Type IV sampling) method. Contrasting SUMMA grab sampling, ISVS sample media is directly exposed to tank vapor gases by placement in the tank headspace. The ISVS sampling equipment consists of a riser adapter, an air pump mounted on a handcart, a manifold for connecting sample tubing, tube bundle assembly which has a sampling head containing the sample media, and the sample media.

The sampling begins by opening a tank riser designated for sampling; installing the riser adapter; inserting the plastic sleeved sample tubes (with the sampling head/media attached) into the riser to the required sampling depth; attaching the sample tubes to the air pump handcart; sampling for a period of time; removal of the sample lines and sample media; removal of the riser adapter and closing the riser; packaging the samples for shipment to a laboratory; packaging waste for eventual disposal.

* Emission pathway - Existing active and passive point sources

*TWRS facility description - All TWRS SST's, DST's and IMUST's

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR RISER PREPARATION/OPENING	HNF-4327, Rev. 0a		297

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

2. Monitoring:

   * Radiological surveys (swipes for removable contamination) of work area

   * Post job survey

3. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * Follow TWRS ALARACT demonstration for "Installation, Operation, and Removal of Equipment (ALARACT 13)

   * Pre-job survey is performed

   * Use approved containment guideline matrix from HNF-IP-0842, latest revision

   * Do not open risers if sustained winds are >25 mph

   * Open riser time will be minimized

   * HPT coverage will be performed as specified in the Radiological Work Permit

4. Description of Activity:

   Risers may have screw caps, blind flanges, shield plugs, or equipment installed in them. Preparation may include the following:

   Screw caps: A pre-work survey is completed of the riser and the area around the riser. Soil covering is installed around the riser. If the riser or screw cap is highly contaminated, a glove bag may be installed to control contamination spread. Slight contamination is wiped off the riser with damp rags.

   Blind flanges: A pre-work survey is completed of the riser and the immediate work area around the riser, a glove bag may be used to contain the blind flange during removal. Slight contamination is removed with damp rags.

   Shield plugs and other equipment to be removed from risers: Risers may have various types of equipment installed. The equipment will be installed and removed per ALARACT 13. To open the riser, it will be necessary to remove the equipment. A pre-work survey is completed of the riser, installed equipment, and the area around the riser. Soil covering is installed around the risers. If necessary, glove bags or sleeving may be used on smaller pieces of equipment to be removed. Larger items may require the need for a windbreak or containment tent.

When the riser is opened, Industrial Hygiene samples may be taken.

All containments used are in accordance with the containment matrix guide found in HNF-IP-0842, latest revision.

Soil covering may be of a material such as, plastic sheeting, rubber matting, foil backed paper, griflon, or any material which will prevent possible contamination from reaching the soil.

The riser will be closed after all riser activities are completed.

* Emission Pathway - Existing active and passive point sources

* TWRS Facility Description - All TWRS facilities

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR INSTALLATION/OPERATION/REMOVAL OF PUSH MODE CORE SAMPLING EQUIPMENT	HNF-4327, Rev. 0a		406

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

2. Monitoring:

   * Radiological surveys (swipes for removable contamination) of work area

   * Post job survey(s)

3. Radiological Controls:

   * When opening riser, use TWRS ALARACT demonstration controls for "Riser Preparation/Opening" (ALARACT 1)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * HPT coverage will be performed as specified in the Radiological Work Permit

   * Do not initiate sampling activities if sustained winds are >25 mph

   * Valves, caps, plugs, used to minimize open riser time

   * Core sampler seal in place

   * Threaded connections and/or cam-locks

   * Verify passive or active HEPA filtration on tanks

   * Use approved containment guideline matrix from HNF-IP-0842, latest revision

4. Description of Activity:

   Push Mode Core Sampling (PMCS) is conducted with the Rotary Mode Core Sampling (RMCS) System. The RMCS System can operate in either push mode or rotary mode. The preferred mode of RMCS sampling is push mode, which does not involve rotation of the drill string or significant purge gas flow, and is the subject of this ALARACT demonstration. Each RMCS System consists of the sample truck, an optional diesel powered electric generator, an optional in-tank video camera, a pressurized nitrogen supply, and other support equipment. In addition to the three RMCS Systems, there is one PMCS System that operates only in push mode.

   Core Sampling system set up and sampling are controlled by operating procedures. Prior to moving the RMCS truck and equipment onto a tank, a walk down is performed. The walk down identifies any physical obstructions/barriers to truck placement and verifies the riser locations. The Core Sampling truck and equipment are then moved to the tank farm for system set up. System set up includes installation of the riser sleeve and riser equipment. This requires that the riser flange cover be removed. Following removal of the riser flange cover, the riser sleeve and riser adapter equipment are installed. This equipment seals against the riser flange, protecting the air pathway. The time between the removal of the flange cover and installation of the riser adapter equipment is kept to the minimum necessary to safely complete the task. HPT coverage is provided the entire time the riser is open.

The operation of core sampling begins by inserting a drill string made up of drill rod sections, into the waste. The first section to be installed is the core barrel in which the core sampler itself is seated. The rotary mode core samplers contain a seal against the bottom of the core barrel. The seal is designed to prevent back flow of tank waste into the drill string. This protects the air pathway out of the tank. The remaining drill rod sections are screwed on to the drill string and inserted into the tank until the starting point for the first core sample segment is reached.

After the first core sample segment has been taken, additional drill string sections and samplers may be added as needed.   During push mode sampling, nitrogen gas (or other fluid such as water) is used only in amounts sufficient to maintain the hydrostatic head and prevent or minimize movement of tank waste into the core barrel.

When the segment is complete, the drill string is disconnected from the core sample truck and is capped. The core sampler truck platform is rotated to align and connect the shielded receiving vessel ("shielded receiver") with the drill string. During the connection the air pathway is protected by closed valves on the shielded receiver and on the adapter on the end of the drill string.

When the sampler is removed from the tank, it is placed directly into the shielded receiver without disturbing the air tight seal between the shielded receiver and the drill string. The isolation valves on the shielded receiver and the drill string adapter are closed before disconnecting the shielded receiver from the drill string. The truck platform then rotates to place the shielded receiver either directly over a shipping cask, or the shielded receiver may be positioned over an x-ray machine to allow the sampler to be x-rayed. In either case, the sealed drill string remains in place at the tank riser to maintain the seal to the atmosphere. From the shielded receiver, the sampler is mechanically lowered into a transport cask. Once the sampler is in the transport cask and the shielded receiver has been disconnected, the cask is immediately sealed.

While the sampler is being replaced after each segment, with the RMCS System, nitrogen is injected into the drill string at approximately 0.03 cubic meter per minute. This maintains the hydrostatic head in the drill string, minimizing waste from entering the drill string. This also allows for pressurization and depressurization of the shielded receiver, as necessary, for sampler change out. For the PMCS System, water is used to maintain the hydrostatic head.

Once a complete core has been obtained, the RMCS truck can be repositioned on the same riser or moved to a different riser on the same tank to obtain additional cores. During RMCS breakdown, the drill string is sleeved as it is removed from the tank and placed into a waste container. When sampling is complete at one tank, the RMCS system will be disconnected and moved to the next tank.

* Emission pathway **-** Existing active and passive point sources (Displacement gas used in drill string which is a closed system and has minimal/no emission impact)

* TWRS facility description **-** All SST's, DST's and IMUST's

Project Title	**Permit No**	**Date Approved**	**NOC_ID**
TWRS ALARACT DEMONSTRATION FOR INSTALLATION/OPERATION/REMOVAL OF AUGER SAMPLING EQUIPMENT	HNF-4327, Rev. 0a		287

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

2. Monitoring:

   * Radiological surveys (swipes for removable contamination) of work area

   * Post job survey(s)

3. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * HPT coverage will be performed as specified in the Radiological Work Permit

   * Do not initiate auger sampling if sustained winds are >25 mph

   * Use valves, caps, and plugs to minimize open riser time

   * Cam locks used to secure receiving cask to riser and shipping cask

   * Verify passive or active HEPA filtration on tanks

   * Contain contaminated equipment

   * Temporary cover placed on top of receiving cask

   * Sample contained when in shipping cask

4. Description of Activity:

   Auger sampling represents one technique to remove a sample from tanks which have less than 25 vertical inches of hardened waste material. The auger sampling assembly uses the auger "bit" to obtain a sample of tank waste. Auger sampling equipment consists of an auger "bit", auger rod, auger sleeving assembly, receiving cask, and an on-site transfer cask (OTC).

   To begin, a tank riser is opened and the auger adapter sleeving assembly is installed into the tank headspace. The installation of the auger sleeving assembly reduces open riser time. The auger sleeving assembly provides lateral strength to the auger bit and auger rod, and extends from the riser to the top of the waste surface. The receiver cask is then mounted on top of the auger adapter sleeving assembly via a camlock fitting. This camlock fitting seals the receiver cask to the auger adapter assembly which is sealed to the riser, thereby minimizing the open riser time.
   The auger rod and auger bit assembly are lowered through the top of the receiver cask assembly, through the interior of the auger sleeving assembly, down to the surface of the tank waste. The portion of the auger rod

extending above the riser is then hand rotated forcing the auger bit to penetrate the tank waste. The tank waste material fills the grooves (flutes) of the auger bit and this constitutes the waste sample.

The auger bit (now containing the sample) and auger rod are pulled up from the tank waste surface, through auger sleeving, and into the receiver cask on top of the riser. During this sample removal step, the auger rod exits the top of the receiver cask into the ambient environment. The auger rod is surveyed for contamination as it is extracted and contained if found to be contaminated. When the auger bit (sample) is within the receiver cask, a ball valve, mounted on the bottom of the receiver cask is closed. The receiver cask is then isolated by placing a temporary cover over the auger rod port.

The receiver cask is moved via crane to the OTC. Once the receiver cask has been connected by a cam lock to the OTC, a handle is connected to the auger bit through the top of the receiver cask and the sample is lowered into the cask. The OTC is sealed and then provides a shipping container for the auger sample.

* Emission pathway **-** Existing active and passive point sources

* TWRS facility description **-** All TWRS SST's, DST's and IMUST's

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR LIGHT DUTY UTILITY ARM (LDUA)			344

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. TWRS Facility Description:

   * All TWRS SST's, DST's, and IMUSTs

2. Emission Pathway:

   * Existing active and passive point sources

3. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

4. Monitoring:

   * Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

   * Post job survey(s)

5. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * HPT coverage will be performed as specified in the Radiological Work Permit

   * Verify passive or active HEPA filtration on tanks

   * The LDUA TRIC will not be set up or removed if sustained winds are >25 mph

   * Riser isolation valve minimizes open riser time

   * HEPA-type filter equipped TRIC. The HEPA-type filter is tested by the manufacturer and used once per tank evolution.

   * VPM Housing

6. Description of Activity/Requirements:

   The Light Duty Utility Arm is a long robotic manipulator arm that is installed, operated, and removed in waste tanks through existing tank risers. A variety of tools (called 'end effectors') can be installed on the end of the arm to perform activities such as: sampling waste materials, tank surveillance and inspections, manipulating in-tank equipment, and performing in-tank analysis of waste properties. The end effectors may be locally waste disturbing near the waste surface (up to 12 inches deep) by probing, scraping, grabbing or sampling tank waste at various locations within the tank. In addition, the end effectors may be used to place monitoring equipment onto or into tank waste.

   The manipulator arm is maintained in a housing on a truck that transports the equipment. The truck contains equipment for vertical and horizontal positioning of the arm and housing. The manipulator arm, housing, and positioning equipment is collectively called the Vertical Positioning Mast (VPM).

The riser is opened per ALARACT 1 and a riser isolation valve is installed. The VPM is connected to the riser isolation valve with the Tank Riser Interface and Confinement (TRIC) system. The TRIC provides radiological confinement when the riser isolation valve is open. The TRIC contains gloved ports for hands-on activities, access to change end effectors, and to allow vapor sampling. The TRIC is equipped with a HEPA-type filter.

A decontamination system provides for gross removal of external contamination from the mast, arm, and end effector. The decontamination system is attached to the bottom of the confinement enclosure. The decontamination system sprays a ring of water through which the mast, arm, and end effector are withdrawn from the tank and into the housing of the VPM.

When the LDUA is operated in a waste tank, a purge system provides a constant low volume flow of instrument grade air into the LDUA, VPM, and any end effectors. The purge air creates a positive pressure inside the system. This is required for operation in flammable gas environments and also minimizes radioactive contamination from entering the in-tank components. The purge gas exits through the TRIC HEPA-type filter or the tank ventilation system.

Project Title	**Permit No**	**Date Approved**	**NOC_ID**
TWRS ALARACT DEMONSTRATION FOR PIT ACCESS			353

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. 6. TWRS Facility Description:

   * Pits at all TWRS facilities

   * This ALARACT demonstration applies to all pits except 241-ER-152, 241-S-151, 241-UX-154, 241-TX-154, 244-CR Vault DCRT, 244-A Lift Station DCRT, and 244-TX DCRT.

2. 5. Emission Pathway:

   * Existing passive non-point sources

3. 4. Records/Documentation:

   * Work package

   * Radiological work permit

   * Radiological survey report(s)

4. 3. Monitoring:

   * Radiological surveys of the work area as required by the work package. Swipes for removable contamination are required.

   * Swipes will be taken to determine that splash guards are to be maintained below 50,000 dpm/100 cm2 beta/gamma and 20 dpm/100 cm2 alpha

   * Post job survey(s)

5. 2. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Riser Preparation/Opening" (ALARACT 1)

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * Use of a splash guard extending to the edge of the pit

   * Uniformly distributed removable contamination levels within the pit are decontaminated or fixed so that a swipe reads less than 100,000 dpm/100 cm2 beta/gamma and 2,000 dpm/100 cm2 alpha. An approved fixative will be applied to pit surfaces if contamination levels exceed the limits stated above or as needed. Note: The fixative will matrix the contamination to ensure minimization of potential airborne contamination.

   * Splash guard will be taped or sealed to the edge of the pit

   * Pit work will not be performed if sustained winds are >25 mph

   * HPT coverage will be performed as specified in the Radiological Work Permit

6. 1.Description of Activity/Requirements:

   PREPARATION WORK: A pre-job survey is performed on the exterior surface of the pit and the surrounding area. A fall protection handrail is installed around the pit. The fall protection is draped in plastic sheeting that extends to the top of the pit. This establishes a splash guard around the pit. Before the cover blocks are removed, an approved fixative may be applied inside the pit or the pit may be decontaminated as described below. These processes are generally performed through an access port. If there is no access port(s), the cover blocks are raised and suspended, a radiological survey is performed, and/or a fixative may be applied inside the pit as described in Section 2, Radiological Control. The cover blocks are removed.

DECONTAMINATION: Uniformly distributed removable contamination levels in the pit are decontaminated/fixed to less than 100,000 dpm/100cm2 beta/gamma and 2,000 dpm/100cm2 alpha by washing and/or an approved fixative is applied to pit surfaces. Fixative will matrix the contamination to ensure minimization of potential airborne contamination. If a high pressure (up to 3,000 psi) or low pressure (approximately 125 psi) whirly is installed, it is done through an opening (if one exists) in the cover blocks and the pit is washed down. The cover blocks are lifted and contained if the removable level is greater than 50,000 dpm/100 cm2 beta/gamma and 20 dpm/100 cm2 alpha. The cover blocks are then moved to a storage area. With the cover blocks off, additional decontamination activities may include the use of chemicals, peel and strip paints, water, or manual scrub brushes. When decontamination activities are complete, other work may begin or a temporary cover is installed over the pit.

CLOSURE: After all activities in the pit are completed, the cover blocks are reinstalled and the splash guard is removed.

Project Title	Permit No	Date Approved	NOC_ID
TWRS ALARACT DEMONSTRATION FOR SIZE REDUCTION OF WASTE EQUIPMENT FOR DISPOSAL	HNF-4327, Rev. 0c		434

Conditions (state only enforceable)

TWRS ALARACT DEMONSTRATIONS

1. 6. TWRS Facility Description:

   * All TWRS Facilities

2. 5. Emission Pathway:

   * Active and passive, point sources and fugitive sources

3. 4. Records/Documentation:

   * Radiological work permit

   * Radiological survey report(s)

4. 3. Monitoring:

   * Radiological surveys

   * Post job survey(s)

5. 2. Radiological Controls:

   * Follow TWRS ALARACT demonstration for "Packaging and Transportation of Waste" (ALARACT 4)

   * Equipment with removable contamination will be contained per the containment guideline matrix from HNF-IP-0842 or decontaminated.

   * HPT coverage as specified in the Radiological Work Permit

6. 1. Description of Activity/Requirements:

   Size reducing, cutting or disassembling contaminated material and equipment for more economical waste packaging. Contaminated devices are employed as applicable per the contaminated guideline matrix. The process is limited to mechanical cutting techniques such as low speed and high speed sawing, snipping, shearing, as well as hot work such as cutting torches. The process will also include bending, crimping, and compaction to preclude the need for cutting operations.

   Examples of items cut up or disassembled for waste disposal during facility operations include long length contaminated equipment, (i.e. waste tank level instrumentation, thermocouple trees, specific gravity probes, observation ports, hose and piping) waste sampling equipment, (i.e. drill strings or augers) pumps, compressors and deactivated exhausters with associated ductwork. This includes replacement and disposal of flexible ventilation ductwork located upstream of HEPA filtration.

TECHNICAL SUPPORT DOCUMENT

BUILDING 1706-KE Lab

Building Description:

This laboratory is a small concrete building connected to the KE basin.

EMISSION UNIT: 1706KE 100KR-1706KE-001

Emission Unit Location:

46° 38' 57" N
119° 35' 49" W

Major Stack: No

Process Description:

The 1706 KE Lab is used primarily as office space with occasional lab support for near field testing and analysis.

Stack Height: 7.6 ft. 2.32 m

Stack Diameter: 1.5 ft. 0.46 m

Average Stack Effluent Temperature: 77 degrees farenheit 23.5 degrees Celsius

ExhaustVelocity: 113 ft/second 113.0 m/second

Average Volumetric Flow Rate: 200 cfm 5.7 cubic meters/sec

Controls:

The controls for the KE Lab are an analysis hood exhausting through a HEPA filter.

TECHNICAL SUPPORT DOCUMENT

BUILDING 209 E CRITICALITY LAB

Building Description:

Also called the "Mass Criticality Lab", the 209-E is currently in the 90 day storage pad for the tank farms. Two 90-day storage pads and a low level was accumulation area are located there. That is the interim staging area for solid waste received from the tank farms. Once received, the waste can undergo assaying, sampling and repackaging. The waste is designated either low level, mixed or non-radioactive hazardous. Upon designation, the waste is shipped to its ultimate destination.

EMISSION UNIT: 296-P-31 200EP-296P031-001

Emission Unit Location:

46° 33' 21" N
119° 31' 45" W

Major Stack: No

Process Description:

In the past it was a critical mass lab with was used to do solution experiments on plutonium and uranium. This lab has since been sealed with its own ventilation system. 209-E currently is the 90 day storage pad for the Tank Farms. Two 90 day storage pads and a low level waste accumulation area are located there. It is the interim staging area for solid waste received from the Tank Farms. Once received the waste can undergo assaying, sampling and repackaging. The waste is designated either low level, mixed or non-radioactive hazardous. Upon designation the waste is shipped to its ultimate destination.

Stack Height: 33.0 ft. 10.06 m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

This emission unit must operate through two HEPA filters and one fan prior to the sampling port. The HEPA filters are the required claimed control technology for emission unit, and the fan is a required control technology ensuring the integrity of the HEPA filtration system.

TECHNICAL SUPPORT DOCUMENT

BUILDING 222-S LABORATORY COMPLEX

Building Description:

The 222-S laboratory is a 2-story above ground building with a subterranean service level. The building is divided into laboratory support spaces, office space, a multi-curie wing, seven environmental hot cells and supplemental service areas.

EMISSION UNIT: 296-S-23 200WS-296S023-001

Emission Unit Location:

46° 32' 5.6" N
119° 37' 13" W

Major Stack: No

Process Description:

The 219-S Sample Gallery is used to perform analyses of waste samples prior to treatment and disposal. The exhaust system is operated only when the hood is in use

Stack Height: 7.0 ft. 2.13 m

Stack Diameter: 1.0 ft. 0.30 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 23 ft/second 23.3 m/second

Average Volumetric Flow Rate: 18.3 cfm 0.5 cubic meters/sec

Controls:

The 219-S Sample Gallery hood exhaust passes through a pre-filter and a single stage HEPA filter located at the hood. It then passes through another single stage HEPA filter and a fan prior to exiting the stack

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-S-21 200WS-296S021-001

Emission Unit Location:

46° 32' 5.6" N
119° 37' 13" W

Major Stack: No

Process Description:

The 222-S Laboratory Complex provides radiological and non-radiological analytical services for the Hanford site with the main emphasis on waste tank characterization, waste management, and environmental monitoring. The process area consists of two sections. The west central section contains laboratories and service areas for analysis of low level radioactive and /or toxic materials. The east central section, commonly referred to as the multicurie section, contains laboratories, hot-cells, and service areas for analysis of high-level radioactive and/or toxic materials.

Stack Height: 37.0 ft. 11.28 m

Stack Diameter: 6.5 ft. 1.98 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 24 ft/second 24.2 m/second

Average Volumetric Flow Rate: 803 cfm 22.7 cubic meters/sec

Controls:

The ventilation system for the 22-S buildings supplied from one source and exhausted through the 296-S-21 stack. the ventilation system is comprised of two branches which join at an exhaust plenum prior to the final filtering. The main branch provides exhaust from all fume hoods and room exhausters. the exhaust air from this branch passes through a pre-filter, single stage HEPA filter, and a damper at each hood or exhauster prior to entering the plenum. The second branch provides ventilation to all eleven hot cells within the facility. The exhaust air from each hot cell passes through a prefilter, single stage HEPA filter, and a damper prior to entering the 222-SC filter building. in the 222-SC filter building the air passes through a damper, HEPA filter, a second damper, a second HEPA filter, and a third damper before exhausting to the plenum. the air from the common plenum is normally exhausted through a single stage of HEPA filters in the 222-SB filter building through three dampered exhaust fans prior to exhausting out the stack.
In the event of an emergency, a backup diesel driven exhaust fan is used to exhaust a portion of the air through a single stage HEPA filter in the 222-SE filter building. The air then passes through the fan damper and out the stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-S-16 200WP-296S016-001

Emission Unit Location:

46° 32' 5.4" N
119° 37' 14" W

Major Stack: No

Process Description:

Exhausts from 219-S bldg vault and waste tanks.

Stack Height: 9.0 ft. 2.74 m

Stack Diameter: 0.3 ft. 0.10 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 33 ft/second 32.5 m/second

Average Volumetric Flow Rate: 2.83 cfm 0.1 cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING 241-A TANK FARM

Building Description:

Consists of 6 single shell tanks and a double-contained receiver tank (DCRT) designed to hold decanted supernate liquids from the underground storage tanks.

EMISSION UNIT: A106 200EP-241A106-001

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: 296-P-41 200EP-296P041-001

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

Portable exhauster to be used on 241-A-101 during salt well pumping and other routine activities.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-A-42 200EP-296A042-001

Emission Unit Location:
° ' " N
° ' " W

Major Stack: Yes

Process Description:
Ventilates AY/AZ tank farm.

Stack Height: 55.0 ft. 16.76 m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 75 degrees farenheit 22.9 degrees Celsius

ExhaustVelocity: 900 ft/second 900.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: A101 200EP-241A101-001

Emission Unit Location:
11° 999' 999" N
999° 999' 999" W

Major Stack: No

Process Description:
This stack description should be used for any passive stack in the A farm

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: A105 200EP-241A105 001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:
Portable exhauster for 241-A-104, 105 and 106 tanks.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: A102 200EP-241A102-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: A104 200EP-241A104-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: A103 200EP-241A103-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-A-26 200EP-204AR-001

Emission Unit Location:

46° 33' 9.7" N
119° 31' 8.6" W

Major Stack: No

Process Description:

Exhauster for the the 241-AN Tank Farm.

Stack Height: 27.0 ft. 8.23 m

Stack Diameter: 1.1 ft. 0.34 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 1,665 ft/second ,665.0 m/second

Average Volumetric Flow Rate: 1670 cfm 47.3 cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING 241-AN TANK FARM

Building Description:

Consists of seven double shell tanks. Double shell tanks were fabricated as three concentric tanks. Waste is stored in the freestanding primary tank. The secondary tank sits on a concrete pad. The completely enclosed annulus serves as a containment barrier if the primary tank should leak. The annulus is ventilated and continually monitored for evidence of primary leakage. The third tank is a concrete shell that encloses the sides of both primary and secondary tanks for additional containment,radiation shielding, and structural support. The capacity ranges from 1 to 1.2 million gallons.

EMISSION UNIT: 296-A-30 200EP-296A030-001

Emission Unit Location:

46° 33' 24" N
119° 31' 0.07" W

Major Stack: No

Process Description:

This emission unit ventilates seven tank annulus's from 241-AN-101 through 241-AN-107.

Stack Height: 23.0 ft. 7.01 m

Stack Diameter: 2.0 ft. 0.61 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 89 ft/second 88.6 m/second

Average Volumetric Flow Rate: 278 cfm 7.9 cubic meters/sec

Controls:

This unit handles air from seven annulus' for tanks AN-101 through AN-107. The annulus air is vented into two trains of identical controls. Each train consists of a demister, a heater, 2 banks of 2 parallel HEPA filters, a valve, a fan, then out the stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-A-29 200EP-296AN-001

Emission Unit Location:

46° 33' 24" N
119° 31' 0.02" W

Major Stack: No

Process Description:

Exhausts filtered air from all 241-AN tanks (AN-101 through AN 107).

Stack Height: 15.0 ft. 4.57 m

Stack Diameter: 1.0 ft. 0.30 m

Average Stack Effluent Temperature: 110 degrees farenheit 33.5 degrees Celsius

ExhaustVelocity: 18 ft/second 18.2 m/second

Average Volumetric Flow Rate: 14.3 cfm 0.4 cubic meters/sec

Controls:

This emission point takes vented exhaust from seven tanks, 241-AN-101 through 241-AN-107. Each tank has an isolation damper before entering the exhaust manifold. The tanks are divided into two exhaust trains each with a manifold. Tanks 101, 102 and 103 make up one exhaust train. Tanks 104 through 107 make up the other train. The train manifolds are connected with a valved inter-tie. Each manifold has an isolation valve downstream of the inter-tie, between the inter-tie and the exhaust train's bank of controls. Each parallel bank of controls are identical and are arranged in this order; a de-entrainer, heater, pre-filter, two HEPA's in series, a valve and a fan. The fans exhaust air from each manifold separately to the stack. Both exhaust trains (including parallel banks of controls) have the capability of venting all the previously mentioned tanks.

TECHNICAL SUPPORT DOCUMENT

BUILDING 241-AP TANK FARM

Building Description:

Double shell tanks were fabricated as three concentric tanks. Waste is stored in the freestanding primary tank. The secondary tank sits on a concrete pad. The completely enclosed annulus serves as a containment barrier if the primary tank should leak. The annulus is ventilated and continually monitored for evidence of primary leakage. The third tank is a concrete shell that encloses the sides of both primary and secondary tanks for additional containment,radiation shielding, and structural support. The capacity ranges from 1 to 1.2 million gallons.

EMISSION UNIT: 296-A-40 200EP-296AP-001

Emission Unit Location:

46° 33' 3.6" N
119° 30' 51" W

Major Stack: No

Process Description:

Exhausts filtered air from all 241-AP waste storage tanks (AP-101 through AP-108).

Stack Height: 13.3 ft. 4.05 m

Stack Diameter: 0.8 ft. 0.25 m

Average Stack Effluent Temperature: 110 degrees farenheit 33.5 degrees Celsius

ExhaustVelocity: 36 ft/second 35.8 m/second

Average Volumetric Flow Rate: 19.4 cfm 0.5 cubic meters/sec

Controls:

This is the primary exhauster for tanks 241-AP-101, through 241 AP-108 There are two parallel flow paths which operate through two dampers and a deentrainer, two dampers with a cross tie between the parallel paths, a heater, prefilter, 2 stage HEPA filters, a damper, and a fan.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-A-41 200EP-296A041-001

Emission Unit Location:
46° 33' 3.6" N
119° 30' 51" W

Major Stack: No

Process Description:
Exhausts filtered air from all 241-AP tank annuli (AP-101 through AP-108).

Stack Height: 29.0 ft. 8.84 m

Stack Diameter: 2.3 ft. 0.70 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 145 ft/second 144.9 m/second

Average Volumetric Flow Rate: 602 cfm 17.0 cubic meters/sec

Controls:
This exhauster serves as the annulus exhauster for double shell tanks AP-21-101 through 241-AP-107. There are two parallel flow paths consisting of a valve, heater, 2 stage HEPA's, and fan. The flow paths combine again before the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 241-AW TANK FARM

Building Description:

Double shell tanks were fabricated as three concentric tanks. Waste is stored in the freestanding primary tank. The secondary tank sits on a concrete pad. The completely enclosed annulus serves as a containment barrier if the primary tank should leak. The annulus is ventilated and continually monitored for evidence of primary leakage. The third tank is a concrete shell that encloses the sides of both primary and secondary tanks for additional containment,radiation shielding, and structural support. The capacity ranges from 1 to 1.2 million gallons.

EMISSION UNIT: 296-A-27 200EP-296AW-001

Emission Unit Location:

46° 33' 4.5" N
119° 31' 1" W

Major Stack: No

Process Description:

Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling, characterization, and waste retrieval, and the transfer and storage of chemical and radiological wastes generated on the Hanford site.

Stack Height: 16.0 ft. 4.88 m

Stack Diameter: 0.8 ft. 0.25 m

Average Stack Effluent Temperature: 110 degrees farenheit 33.5 degrees Celsius

ExhaustVelocity: 3 ft/second 2.8 m/second

Average Volumetric Flow Rate: 1.48 cfm 0.0 cubic meters/sec

Controls:

Tanks 241-AW-101/102/103/104/105/106 exhaust through a damper and through a parallel series of a damper, de-entrainer, two dampers, a heater, a prefilter, two HEPA filters, a damper and a fan.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-A-28 200EP-296A028-001

Emission Unit Location:

46° 33' 44" N
119° 31' 1" W

Major Stack: No

Process Description:

Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling, characterization, and waste retrieval, and the transfer and storage of chemical and radiological wastes generated on the Hanford site

Stack Height: 12.0 ft. 3.66 m

Stack Diameter: 2.0 ft. 0.61 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 59 ft/second 59.0 m/second

Average Volumetric Flow Rate: 185 cfm 5.2 cubic meters/sec

Controls:

Tank 241-AW-101, Tank 241-AW-102, Tank 241 AW 103, Tank 241 AW-104, Tank 241 AW- 105, Tank 241 AW- 106, Tank 241 AW-107, and Tank 241 AW-108 must operate through two dampers and a series of a de-entrainer, two dampers, a heater, prefilter, two HEPA filters, a damper, and a fan prior to the sampling port.

TECHNICAL SUPPORT DOCUMENT

BUILDING 241-AY/AZ TANK FARM

Building Description:

The AY and AZ tank farm contains xx double shell tanks. Double shell tanks were fabricated as three concentric tanks. Waste is stored in the freestanding primary tank. The secondary tank sits on a concrete pad. The completely enclosed annulus serves as a containment barrier if the primary tank should leak. The annulus is ventilated and continually monitored for evidence of primary leakage. The third tank is a concrete shell that encloses the sides of both primary and secondary tanks for additional containment,radiation shielding, and structural support. The capacity ranges from 1 to 1.2 million gallons.

EMISSION UNIT: 296-A-19 200EP-296A019-001

Emission Unit Location:

46° 33' 14" N
119° 31' 3.9" W

Major Stack: No

Process Description:

This system is presently defunct and out of operation. Should this system operate, the process would exhaust the annulus from 241-AY-102.

Stack Height: 12.9 ft. 3.93 m

Stack Diameter: 1.4 ft. 0.43 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 16 ft/second 16.4 m/second

Average Volumetric Flow Rate: 25.2 cfm 0.7 cubic meters/sec

Controls:

The exhaust from the tank exits the annulus which is valved before two parallel HEPA filters. A fan draws the exhaust through the HEPA and vents it out the stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-A-18 200EP-296A018-001

Emission Unit Location:

46° 33' 17" N
119° 31' 4.3" W

Major Stack: No

Process Description:

This system is presently out of operation. Should this system operate, the process would exhaust the annulus rom the 241-AY-202 tank.

Stack Height: 12.5 ft. 3.81 m

Stack Diameter: 1.4 ft. 0.43 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 18 ft/second 17.6 m/second

Average Volumetric Flow Rate: 27.1 cfm 0.8 cubic meters/sec

Controls:

The exhaust from the tank exits the annulus which is valved before two parallel HEPA filters. A fan draws the exhaust through the HEPA and vents it out the stack.

EMISSION UNIT: 296-A-43 200EP-296A043-001

Emission Unit Location:

° ' " N
° ' " W

Major Stack: No

Process Description:

200E

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-A-20 200EP-296A020-001

Emission Unit Location:

46° 33' 19" N
119° 31' 0.3" W

Major Stack: No

Process Description:

241-AZ 101/102 tank annuli filtered exhaust.

Stack Height: 15.0 ft. 4.57 m

Stack Diameter: 2.0 ft. 0.61 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 14 ft/second 14.1 m/second

Average Volumetric Flow Rate: 44.3 cfm 1.3 cubic meters/sec

Controls:

The annulus for tanks 241-AZ-101 and 241-AZ-102 are ventilated by this emission unit. The annulus air passes through a valve before being piped to a common exhaust line. The air passes through two parallel HEPA filters, through a fan and out the stack.

EMISSION UNIT: 296-A-17 200EP-296AYAZ-001

Emission Unit Location:

46° 33' 15" N
119° 31' 0.5" W

Major Stack: Yes

Process Description:

Exhausts noncondensible vapors from AY & AZ tank farms. Non-operational.

Stack Height: 50.0 ft. 15.24 m

Stack Diameter: 1.5 ft. 0.46 m

Average Stack Effluent Temperature: 110 degrees farenheit 33.5 degrees Celsius

ExhaustVelocity: 32 ft/second 31.9 m/second

Average Volumetric Flow Rate: 56.4 cfm 1.6 cubic meters/sec

Controls:

This emission unit ventilates exhaust from four tanks; tank 241-AY-101, 241-AY-102, 241-AZ-101, and 241-AZ- 102. Each tank is valved before it enters the exhaust system. The first set of controls are not visibly verifiable. In order, they consist of a de-entrainer, a condenser, and another de-entrainer. The first visible set of controls down-stream are six HEPA filters in parallel . The exhaust fan is isolated with valves up-stream and down-stream. The exhaust fan is backed-up with a duplicate valve/fan configuration. The fan exhausts to the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 241-BX TANK FARM

Building Description:
SAME AS ID 67? Consists of 12 single/double shelled tanks and a DCRT receiver tank.

EMISSION UNIT: BX106 200EP-241BX106-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: BX104 200EP-241BX104-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: BX110 200EP-241BX110-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: BX103 200EP-241BX103-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: BX107 200EP-241BX107-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: BX101 200EP-241BX101-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: BX112 200EP-241BX112-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: BX108 200EP-241BX108-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: BX111 200EP-241BX111-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: BX109 200EP-241BX109-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: BX102 200EP-241BX102-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: BX105 200EP-241BX105-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING 241-C TANK FARM

Building Description:
Consists of 12 one million gallon single shell steel tanks and four 55,000 gallon single shell steel tanks.

EMISSION UNIT: C107 200EP-241C107-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:
single shell tank

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: C101 200EP-241C101-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:
single shell tank

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: C202 200EP-241C202-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: C109 200EP-241C109-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:
single shell tank

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: C110 200EP-241C110-001

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: C203 200EP-241C203-001

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: C102 200EP-241C102-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:
single shell tank

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: 296-C-6 200EC-106 Sluicing

Emission Unit Location:
o ' " N
o ' " W

Major Stack: Yes

Process Description:
The waste retrival slucing system(WRSS) will be designed to remove the sludge from Tank 106-C and transport material to the 102-AY- Tank. The scope also includes conveying waste out of 106-C tank, transferring waste, removing heat to maintain safe temperature levels, and shielding operations and maintenance actions.

Stack Height: 4.9 ft. 1.49 m

Stack Diameter: 0.5 ft. 0.15 m

Average Stack Effluent Temperature: 69 degrees farenheit 21.0 degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:
The control system is equipped with a High Efficiency mist eliminator (HEME), heater and two HEPA filters before discharging to the atmosphere.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-P-16 200EP-296P016-001

Emission Unit Location:

46° 33' 28" N
119° 31' 11" W

Major Stack: Yes

Process Description:

The single shell tanks(SST) are being interim stabilized and isolated. Interim stabilization involves the removal of supernate and interstitial liquid from SST's to minimize the spread of contamination if the tank begins to leak. Interim isolation of a SST involves physical modifications to preclude the inadvertent addition of liquid to the tank.

Stack Height: 3.0 ft. 0.93 m

Stack Diameter: 1.3 ft. 0.40 m

Average Stack Effluent Temperature: 110 degrees farenheit 33.5 degrees Celsius

ExhaustVelocity: 32 ft/second 32.1 m/second

Average Volumetric Flow Rate: 42.7 cfm 1.2 cubic meters/sec

Controls:

The C farm tanks pass through a damper, a deentrainer, a pre filter, two HEPA filters and a fan

EMISSION UNIT: C108 200EP-241C108-001

Emission Unit Location:

° ' " N
° ' " W

Major Stack: No

Process Description:

single shell tank

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: C204 200EP-241C204-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: C111 200EP-241C111-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: C112 200EP-241C112-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: C201 200EP-241C201-001

Emission Unit Location:
o ' " N
o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING 241-SX TANK FARM

Building Description:

The SX Tank Farm houses single shelled tanks ranging in size from 50,000 to 1.2 million gallons. These single shelled tanks only store waste; no transfers occur into these tanks.

EMISSION UNIT: SX113 200WP-241SX113-001

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling characterization, and waste retrieval and the transfer and storage of chemical and radiological wastes generated on the Hanford site.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

The passively ventilated tanks exhaust through a HEPA filter.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-S-15 200WP-296SX-001

Emission Unit Location:

46° 32' 33" N
119° 38' 13" W

Major Stack: No

Process Description:

Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling, characterization, and waste retrieval, and the transfer and storage of chemical and radiological wastes generated on the Hanford site.

Stack Height: 15.0 ft. 4.57 m

Stack Diameter: 1.2 ft. 0.36 m

Average Stack Effluent Temperature: 75 degrees farenheit 22.9 degrees Celsius

ExhaustVelocity: 7 ft/second 7.3 m/second

Average Volumetric Flow Rate: 7.83 cfm 0.2 cubic meters/sec

Controls:

The Single Shelled Tanks 241-SX-101 through 241-SX-112 and 241-SX-114 each exhaust through an isolation damper. All tanks cascade in a single line to two parallel exhaust banks, each having a pre filter, two in series HEPA filters and a exhaust fan with a suction isolation damper. These two exhaust banks then merge into a single line going out the stack.

EMISSION UNIT: SX115 200WP-241SX115-001

Emission Unit Location:

° ' " N
° ' " W

Major Stack: No

Process Description:

Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling characterization, and waste retrieval and the transfer and storage of chemical and radiological wastes generated on the Hanford site.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

The passively ventilated tanks exhaust through a HEPA filter.

TECHNICAL SUPPORT DOCUMENT

BUILDING 241-SY TANK FARM

Building Description:

All double shell tanks were fabricated as three concentric tanks. Waste is stored in freestanding primary tank. The secondary tank sits on a concrete pad. The completely enclosed annulus serves as a containment barrier if the primary tank should. The annulus is vented and continually monitored for evidence of primary leakage. The third tank is a concrete shell that encloses the sides of both primary and secondary tanks for additional containment, radiation shielding and structural support. The capacity of double shell tanks ranges from 1 to 1.2 million gallons.

EMISSION UNIT: 296-P-44 200WW-PORTEX 024

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

Portable exhauster used on single shell tanks during saltwell pumping on single shell tanks 241-A-101 and 241-U-102.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-S-25 200WS-296S025 001

Emission Unit Location:

46° 32' 26" N
119° 37' 40" W

Major Stack: No

Process Description:

Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling, characterization, and waste retrieval. Transfer and storage of chemical and radiological wastes generated on the Hanford site.

Stack Height: 18.5 ft. 5.64 m

Stack Diameter: 0.7 ft. 0.20 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

Tanks' 241-SY-101/102/103 each exhaust by a single line through an isolation damper prior to forming a common line. The common line then exhausts through a deentrainer, heater, prefilter, two HEPA filters in series, and a fan prior to exit out the stack. This is the 241-SY replacement exhauster/stack for exhausting filtered air from the 241-SY101,-102,-103 tanks.

EMISSION UNIT: 296-P-28 200WP-296P028-001

Emission Unit Location:

46° 32' 26" N
119° 37' 41" W

Major Stack: No

Process Description:

Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling, characterization, and waste retrieval, and the transfer and storage of chemical and radiological wastes generated on the Hanford site.

Stack Height: 11.0 ft. 3.35 m

Stack Diameter: 0.7 ft. 0.20 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 33 ft/second 32.6 m/second

Average Volumetric Flow Rate: 11.5 cfm 0.3 cubic meters/sec

Controls:

Tanks' 241-SY-101/102/103 each exhaust by a single line through an isolation damper prior to forming a common line. The common line then exhausts through a isolation damper, de-entrainer, heater, two HEPA filters in series, and a fan prior to exiting out the stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-P-43 200WW-PORTEX 020

Emission Unit Location:

° ' " N
° ' " W

Major Stack: No

Process Description:

Portable Exhauster on SSTs during Saltwell Pumping.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: 296-P-22 200WP-296P022-001

Emission Unit Location:

46° 32' 25" N
119° 37' 41" W

Major Stack: No

Process Description:

Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling, characterization, and waste retrieval, and the transfer and storage of chemical and radiological wastes generated on the Hanford site.

Stack Height: 10.2 ft. 3.11 m

Stack Diameter: 0.7 ft. 0.20 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 37 ft/second 37.4 m/second

Average Volumetric Flow Rate: 13.2 cfm 0.4 cubic meters/sec

Controls:

This stack exhausts filtered air from the annuli in tanks 241-SY-101, -102 and -103. Each tank has an isolation damper and then connects to a common exhaust line. This common line travels through a moisture separator, a heater, a pre-filter, two HEPA's in series and is then exhausted through a single exhaust fan and out the stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-P-45 200WW-PORTEX 025

Emission Unit Location:
46° 32' 26" N
119° 37' 40" W

Major Stack: No

Process Description:
Portable Exhauster on SSTs during Saltwell Pumping.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: 296-P-23 200WP-296SY-001

Emission Unit Location:
46° 32' 25" N
119° 37' 42" W

Major Stack: No

Process Description:
Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling, characterization, and waste retrieval, and the transfer and storage of chemical and radiological wastes generated on the Hanford site.

Stack Height: 13.0 ft. 3.96 m

Stack Diameter: 8.0 ft. 2.44 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 41 ft/second 41.2 m/second

Average Volumetric Flow Rate: 2070 cfm 58.6 cubic meters/sec

Controls:
Tanks' 241-SY-101/102/103 each exhaust by a single line through an isolation damper prior to forming a common line. The common line then exhausts through an isolation damper, de-entrainer, heater, pre-filter, two HEPA filters in series, and an exhaust fan prior to exit out the stack. The portable exhauster ties in to the common exhaust header just ahead of the de-entrainer.

TECHNICAL SUPPORT DOCUMENT

BUILDING 242-A Evaporator

Building Description:

The 242-A Evaporator is a low temperature, high vacuum evaporator designed to boil off tank liquid, leaving a thickened slurry. The facility is 62 feet high, 51 feet wide and 75 feet long. It has a hot cell that contains the evaporator loop/steam coils for heating the radioactive tank liquids and a condenser room to draw off the tank moisture.

EMISSION UNIT: 296-A-22 200EP-242A-002

Emission Unit Location:

46° 33' 9.1" N
119° 31' 0.8" W

Major Stack: No

Process Description:

This facility process loop operates under a vacuum, boiling off radioactive liquids at a low temperature. The off gases from this process are run through a condenser pot which reduces the condensate from the process. The remaining thickened liquid/slurry is shipped via underground pipes back to the various underground storage tanks while the condensate is transferred to LERF. This process is designed to reduce the volume of waste in tank farms to free tank space for other cleanup activities.

Stack Height: 62.0 ft. 18.90 m

Stack Diameter: 0.7 ft. 0.20 m

Average Stack Effluent Temperature: 117 degrees farenheit 35.7 degrees Celsius

ExhaustVelocity: 31 ft/second 31.0 m/second

Average Volumetric Flow Rate: 10.6 cfm 0.3 cubic meters/sec

Controls:

This vessel vent exhaust system for the evaporator passes through a damper, pre-heater, two HEPA filters, a damper, fan and then out the stack. An inlet air line filtered by a HEPA filter and accessed through a damper, enters the system between the vessel vent and upstream of the first damper and pre-heater.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-A-21 200EP-242A-001

Emission Unit Location:

46° 33' 9.5" N
119° 31' 1.3" W

Major Stack: No

Process Description:

This facility process loop operates under a vacuum, boiling off radioactive liquids at a low temperature. The off gases from this process are run through a condenser pot which reduces the condensate from the process. The remaining thickened liquid/slurry is shipped via underground pipes back to the various underground storage tanks while the condensate is transferred to LERF. This process is designed to reduce the volume of waste in tank farms to free tank space for other cleanup activities.

Stack Height: 22.0 ft. 6.71 m

Stack Diameter: 3.5 ft. 1.07 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 33 ft/second 33.1 m/second

Average Volumetric Flow Rate: 318 cfm 9.0 cubic meters/sec

Controls:

The evaporator is exhausted through two identical/redundant rows of redundant HEPA banks. One side consists of a damper, pre-filter, two HEPA's, a damper, a common header with a damper, another isolation damper and vortex damper just before the exhaust fan, and then the stack. The other side is exactly the same and it also shares the common header just after the HEPA filters/damper.

TECHNICAL SUPPORT DOCUMENT

BUILDING 242-T Evaporator

Building Description:

A Steel reinforced concrete structure 48 feet in length, 42 feet wide and 23 feet high. The building contains a condensate area, feed cell, and and the evaporator area. The process area includes the 242-T building the 242 T A vault, and the 242-TB ventilation building. The control area in the metal building adjacent to the east wall of the 242-T building.

EMISSION UNIT: 296-T-17 200WP-242T-001

Emission Unit Location:

46° 33' 23" N
119° 37' 43" W

Major Stack: No

Process Description:

242-T Evaporator processed waste by reducing the volume through evaporation and crystallization. The evaporator has been placed in the standby/shutdown mode and is not expected to be operated

Stack Height: 32.0 ft. 9.75 m

Stack Diameter: 1.2 ft. 0.36 m

Average Stack Effluent Temperature: 71 degrees farenheit 21.6 degrees Celsius

ExhaustVelocity: 19 ft/second 19.1 m/second

Average Volumetric Flow Rate: 20.5 cfm 0.6 cubic meters/sec

Controls:

The 242-T Building exhausts by a single line through a filter/preheater prior to forming two lines made up of an isolation damper, two parallel lines of two HEPA filters in series, and another isolation damper. The two trains reform at another isolation damper prior to entering two parallel lines made up of an isolation damper and fan prior to exit out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 244 -A-LIFT STATION

Building Description:

EMISSION UNIT: 296-A-25 200EP-244A-001

Emission Unit Location:

46° 33' 19" N
119° 31' 14" W

Major Stack: Yes

Process Description:

This emission system ventilates the 244A Double-Contained Receiver Tank. The DCRT is a 50,000 gallon receiver/storage tank designed to hold liquids decanted from the tank farms underground storage tanks. The decanted supernate liquid is removed from the tanks salt cake via a large salt well pump placed inside the tank. Once the liquid is pumped from the tank it is transferred to the DCRT receiver tank.

Stack Height: 9.5 ft. 2.90 m

Stack Diameter: 0.4 ft. 0.12 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 27 ft/second 26.7 m/second

Average Volumetric Flow Rate: 3.36 cfm 0.1 cubic meters/sec

Controls:

The system ventilation pathway controls air vented from both the DCRT and it's annulus. The following system description is buried under ground: The tank is vented to a heater. The vent from the annulus is joined with the tank exhaust after the heater. The exhaust system is split into two identical exhaust paths which consist of a valve, a prefilter, a first and second stage HEPA filter , and a valve. The system is joined again and emerges above ground into the exhaust fan and out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 244 S-DCRT

Building Description:

The DCRT is a double-contained receiver tank designed for holding decanted supernate liquids from the large underground storage tanks. The tank is contained in a large underground concrete vault covered with concrete cover blocks for easy access. The vault is approximately 30 feet x 20 feet.

EMISSION UNIT: 296-S-22 200WP-244S-001

Emission Unit Location:

46° 32' 22" N
119° 37' 39" W

Major Stack: Yes

Process Description:

The DCRT is a 50,000 gallon receiver/storage tank designed to hold liquids decanted form the tank farms underground storage tanks. The decanted supernate liquid is removed from the tanks salt cake via a large salt well pump placed inside the tank. Once the liquid is pumped from the tank it is transferred to the DCRT receiver tank.

Stack Height: 11.0 ft. 3.35 m

Stack Diameter: 6.0 ft. 1.83 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 13 ft/second 12.6 m/second

Average Volumetric Flow Rate: 355 cfm 10.1 cubic meters/sec

Controls:

The 244-S DCRT exhausts by a single line through a heater (a bypass line exits around the heater) prior to forming two parallel lines containing an isolation damper, pre-filter, and two HEPA filters in series. The lines then rejoin to exhaust through a single fan and then out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 244-AR SLUDGE VAULT

Building Description:

A concrete storage (vault) building designed with process cells and four storage tanks These tanks held and retained different transitional radioactive process liquids over the years. The facility approximate size is 35 ft high, 25 ft wide and 89 ft long. The storage tanks contain small amounts of radioactive liquids. Most of the current process material is contaminated rain water.

EMISSION UNIT: 296-A-13 200EP-244AR-002

Emission Unit Location:

46° 33' 13" N
119° 31' 8.5" W

Major Stack: No

Process Description:

This is an old concrete storage vault designed to store various process liquids in its process storage tanks. These four storage tanks housed within concrete process cells contain small amounts of radioactive liquids. Most of the process material is contaminated rain water.

Stack Height: 61.0 ft. 18.59 m

Stack Diameter: 3.0 ft. 0.91 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 2 ft/second 1.5 m/second

Average Volumetric Flow Rate: 10.7 cfm 0.3 cubic meters/sec

Controls:

This description describes the inlet air system and process operation exhaust system for 244-AR. The inlet portion consists of five inlet filters, and a supply fan. Downstream of process operations runs two exhaust systems. One side consists of a damper, two HEPA's, two dampers, exhaust fan, damper and stack. The other side consists of a damper, HEPA, HEPA bypass damper, second HEPA, second HEPA bypass damper, two back to back HEPA filter's, two damper's, fan exhaust fan, damper and stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 244-BX-DCRT

Building Description:

The 244-BX DCRT is a double contained receiver tank designed for holding decanted supernate liquids from the large underground storage tanks. The tank is contained in a large underground concrete vault covered with concrete cover blocks for access. The DCRT storage tanks capacity ranges from 800 to 45,000 gallons.

EMISSION UNIT: 296-B-28 200EP-244BX-001

Emission Unit Location:

46° 33' 54" N
119° 32' 20" W

Major Stack: Yes

Process Description:

The DCRT is a 50,000 gallon receiver/storage tank designed to hold liquids decanted from the tank farms underground storage tanks. The decanted supernate liquid is removed from the tanks salt cake via a large salt well pump placed inside the tank. Once the liquid is pumped from the tank it is transferred to the DCRT receiver tank.

Stack Height: 11.0 ft. 3.35 m

Stack Diameter: 0.5 ft. 0.15 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 21 ft/second 20.8 m/second

Average Volumetric Flow Rate: 4.08 cfm 0.1 cubic meters/sec

Controls:

The DCRT has an inlet air system supplying ventilation air. The air intake consists of an inlet, a pre-heater, a HEPA, and a damper. Air from the DCRT is exhausted through three identical banks of HEPA filters. Prior to the HEPA's inlet header is a pre-heater connected to a common header which feeds all three HEPA banks. There is an annulus vent which bypasses the exhaust HEPA's pre-heater. The three identical HEPA banks consist of a damper, a pre-filter, two HEPA's, a damper, a common exhaust header, a single exhaust fan (connected to the common exhaust header), and a stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 244-CR-VAULT

Building Description:

The vault is a rentention and treatment facility for high-level radioactive waste.

EMISSION UNIT: 296-C-5 200EP-244CR-001

Emission Unit Location:

46° 33' 24" N
119° 31' 11" W

Major Stack: Yes

Process Description:

Exhausts 244-CR Vault cell and process ventilation.

Stack Height: 48.0 ft. 14.63 m

Stack Diameter: 1.5 ft. 0.46 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 22 ft/second 22.3 m/second

Average Volumetric Flow Rate: 39.5 cfm 1.1 cubic meters/sec

Controls:

The CR ault operates through a pre-filter, two HEPA filters and two parallel fans.

TECHNICAL SUPPORT DOCUMENT

BUILDING 244-TX-DCRT

Building Description:

The DCRT is a double contained receiver tank designed for holding decanted supernate liquids from the large underground storage tanks. The tank is contained in a large underground concrete vault covered with concrete cover blocks for easy access. The vault is approximately 30 feet x 20 feet.

EMISSION UNIT: 296-T-18 200WP-244TX-001

Emission Unit Location:

46° 33' 24" N
119° 37' 43" W

Major Stack: Yes

Process Description:

Activities at the tank farm include surveillance, installation and maintenance of monitoring equipment, sampling, characterization, and waste retrieval, and the transfer and storage of chemical and radiological wastes generated on the Hanford site.

Stack Height: 11.0 ft. 3.35 m

Stack Diameter: 0.5 ft. 0.15 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 23 ft/second 23.0 m/second

Average Volumetric Flow Rate: 4.52 cfm 0.1 cubic meters/sec

Controls:

The 244-TX DCRT exhausts via a single line through a heater (a bypass line exits around the heater) prior to forming three parallel lines containing an isolation damper, pre-filter, two HEPA filters in series, and an isolation damper. The lines then rejoin to exhaust through a single fan prior to exiting out the stack

TECHNICAL SUPPORT DOCUMENT

BUILDING 244-U-DCRT

Building Description:

244-U Salt Well Receiver Vault - Double Container Receiver Tank (DCRT)

EMISSION UNIT: 296-U-11 200WP-244U-001

Emission Unit Location:

46° 32' 11" N
119° 37' 40" W

Major Stack: Yes

Process Description:

The DCRT is a 50,000 gallon receiver/storage tank designed to hold liquids decanted form the tank farms underground storage tanks. The decanted supernate liquid is removed from the tanks salt cake via a large salt well pump placed inside the tank. Once the liquid is pumped from the tank it is transferred to the DCRT receiver tank.

Stack Height: 14.0 ft. 4.27 m

Stack Diameter: 0.5 ft. 0.15 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 14 ft/second 14.0 m/second

Average Volumetric Flow Rate: 2.75 cfm 0.1 cubic meters/sec

Controls:

The 244-U DCRT exhausts via a single line through a heater (a bypass line exits around the heater) prior to forming three parallel lines containing an isolation damper, pre-filter, two HEPA filters in series, and an isolation damper. The lines then rejoin to exhaust through a single fan prior to exiting out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 305 B BUILDING

Building Description:

305b is a two story building of approximately 9176 square feet. The building houses a counting room, instrument rooms, computer room, maintenance shop and change room in addition to an open bay building. This building was added by PNNL in 1995

EMISSION UNIT: 305 B Building 300EP-305B-01-V

Emission Unit Location:

46° 22' 4.5" N
119° 16' 33" W

Major Stack: No

Process Description:

The process performed under this emission unit is collection, consolidation, sampling, packaging and storage of radioactive and mixed waste.

Stack Height: 32.8 ft. 10.00 m

Stack Diameter: 0.8 ft. 0.25 m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: 32 ft/second 31.8 m/second

Average Volumetric Flow Rate: 17.2 cfm 0.5 cubic meters/sec

Controls:

The 305B building hoods exhaust by a single line through a damper, a single HEPA filter, an air control device and fan prior to exiting out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 306-W MATLS DEV LAB

Building Description:

A two story steel framed structure with a laboratory and shop space in the high bay areas. The rest of the building is office space. Contains shops and laboratory facilities for metal-working and ceramic studies.

EMISSION UNIT: 306 W Building 300EP-306W-03-V

Emission Unit Location:

o ' " N

o ' " W

Major Stack: No

Process Description:

The building houses equipment used to create parts for pilot phase fabrication processes. These phases are developed for full scale production. The processes include machining metal parts, metal forging operations, and metal heat treatment. Other processes included in this building are shipping, receiving, inspecting and storage of radioactive materials.

Stack Height: 28.8 ft. 8.78 m

Stack Diameter: 3.6 ft. 1.09 m

Average Stack Effluent Temperature: 74 degrees farenheit 22.6 degrees Celsius

ExhaustVelocity: 40 ft/second 40.0 m/second

Average Volumetric Flow Rate: 403 cfm 11.4 cubic meters/sec

Controls:

The 306W building hot labs exhaust by a single line through two HEPA filters, air control device and fan prior to exit out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 309 Plutonium Recycle Test Reactor

Building Description:

This building was an operational test reactor known as the Plutonium Recycle Test Reactor (PRTR). The building has a concrete containment dome and a containment vessel.

EMISSION UNIT: 309-PRTR 300P-309PRTR-001

Emission Unit Location:

46° 22' 2.8" N
119° 16' 34" W

Major Stack: No

Process Description:

PTRT is deactivated and all the fuel has been removed from the building. The ground level of the containmment building is used as an assembly shop. Characterization in support of transition to decontamination and decommissioning is now complete. Clean out activities in support of transition to decontamination and decommissioning are continiuing. The remainder of the building is used as general office space.

Stack Height: 100.0 ft. 30.48 m

Stack Diameter: 5.0 ft. 1.52 m

Average Stack Effluent Temperature: 70 degrees farenheit 21.3 degrees Celsius

ExhaustVelocity: 6 ft/second 5.9 m/second

Average Volumetric Flow Rate: 117 cfm 3.3 cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING 318 RADIOLOGICAL SCIENCES

Building Description:

The original building has a basement with a concrete foundation plus two steel framed floors. A new one story building was added to the south end of the existing building in 1982. The building contains facilities for calibration of radiation survey instruments for processing personnel dosimeters.

EMISSION UNIT: EP-318-01-S 300EP-318-01-S

Emission Unit Location:

46° 21' 57" N
119° 16' 40" W

Major Stack: No

Process Description:

The main processes in this building are calibration of radiation detection and measurement instruments, radiation dosimetry processing and research in the development of radiation detection and measuring instruments. Sealed sources and gaseous amounts of radionuclides are used in this building.

Stack Height: 39.3 ft. 11.98 m

Stack Diameter: 2.0 ft. 0.61 m

Average Stack Effluent Temperature: 76 degrees farenheit 23.2 degrees Celsius

ExhaustVelocity: 39 ft/second 39.4 m/second

Average Volumetric Flow Rate: 124 cfm 3.5 cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING 320 PHYSCIAL SCIENCE LAB

Building Description:

A rectangular one story concrete steelfram structure, with a basement. Contains the environmental radiochemistry laboratories.

EMISSION UNIT: EP-320-04-S 300EP-320-04-S

Emission Unit Location:

46° 21' 57" N
119° 16' 40" W

Major Stack: No

Process Description:

The following are permitted research activities and processes for this building. Preparation and analysis of environmental sample for detection of ultra trace levels of radionuclides, chemical separations, and purification techniques, isotopic separations and analysis, and development of detection and measuring instruments for race organics.

Stack Height: 26.0 ft. 7.92 m

Stack Diameter: 0.6 ft. 0.18 m

Average Stack Effluent Temperature: 72 degrees farenheit 21.9 degrees Celsius

ExhaustVelocity: 30 ft/second 30.2 m/second

Average Volumetric Flow Rate: 7.98 cfm 0.2 cubic meters/sec

Controls:

The 320 Building Lab 114 exhausts by a single line through a single HEPA filter and fan prior to exit out the stack

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: EP-320-03-S 300EP-320-03-S

Emission Unit Location:

46° 21' 57" N
119° 16' 40" W

Major Stack: No

Process Description:

The following are permitted research activities and processes for this building. Preparation and analysis of environmental samples for detection of ultra trace levels of radionuclides, chemical separations, purification techniques, isotopic separations, analysis, development of detection, and measuring instruments for trace organics.

Stack Height: 26.0 ft. 7.92 m

Stack Diameter: 0.6 ft. 0.18 m

Average Stack Effluent Temperature: 71 degrees farenheit 21.6 degrees Celsius

ExhaustVelocity: 30 ft/second 29.5 m/second

Average Volumetric Flow Rate: 7.79 cfm 0.2 cubic meters/sec

Controls:

The 320 Building Lab 115 exhausts by a single line through a single HEPA filter and fan prior to exit out the stack

EMISSION UNIT: EP-320-01-S 300EP-320-01-S

Emission Unit Location:

46° 21' 57" N
119° 16' 40" W

Major Stack: No

Process Description:

The following are permitted research activities and processes for this building. Preparation and analysis of environmental samples for detection of ultra trace levels of radionuclides, chemical separations, purification techniques, isotopic separations analysis, and development of detection and measuring instruments for trace organics.

Stack Height: 39.7 ft. 12.10 m

Stack Diameter: 5.0 ft. 1.52 m

Average Stack Effluent Temperature: 70 degrees farenheit 21.3 degrees Celsius

ExhaustVelocity: 35 ft/second 35.4 m/second

Average Volumetric Flow Rate: 695 cfm 19.7 cubic meters/sec

Controls:

The 320 Building Labs 113/114/115 exhaust by a single line through two HEPA filters in series, the line then splits into two lines consisting of an air control device, a fan, and another air control device prior to reforming a single and exiting out the stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: EP-320-02-S 300EP-320-02-S

Emission Unit Location:

46° 21' 57" N
119° 16' 40" W

Major Stack: No

Process Description:

The following are permitted research activities and processes for this building. Preparation and analysis of environmental samples for detection of ultra trace levels of radionuclides, chemical separations and purification techniques, isotopic separations, analysis, and development of detection and measuring instruments for trace organics.

Stack Height: 31.8 ft. 9.69 m

Stack Diameter: 0.8 ft. 0.25 m

Average Stack Effluent Temperature: 72 degrees farenheit 21.9 degrees Celsius

ExhaustVelocity: 16 ft/second 15.9 m/second

Average Volumetric Flow Rate: 8.60 cfm 0.2 cubic meters/sec

Controls:

The 320 Building Lab 148 exhausts by a single line through two HEPA filters in series and a fan prior to exit out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 323 MECH PROPERTIES

Building Description:

A one story rectangular shaped metal fram structure buit on a concrete foundation and floor slab. The roof is pitched and the building exterior is made of insulated metal siding. The building houses one small hot cell for investigating structural properties of irradiated material.

EMISSION UNIT: EP-323-01-S 300EP-323-01-S

Emission Unit Location:

46° 22' 7.4" N
119° 16' 52" W

Major Stack: No

Process Description:

The following are processes that occur in this building: Research and development, mechanical testing of metallic and ceramic composites. The building has activation products resulting from irradiation in a reactor.

Stack Height: 16.2 ft. 4.94 m

Stack Diameter: 1.7 ft. 0.51 m

Average Stack Effluent Temperature: 74 degrees farenheit 22.6 degrees Celsius

ExhaustVelocity: 36 ft/second 36.1 m/second

Average Volumetric Flow Rate: 79.1 cfm 2.2 cubic meters/sec

Controls:

The 323 Building Cell exhausts by a single line through a single HEPA filter. The Cell exhaust then forms a single line with the exhaust for the Equipment Room to exhaust through a HEPA filter, an air control device and fan prior to exit out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 324 WASTE TECHNOLOGY

Building Description:

This b uilding consists of 4 levels (basement and 3 floors) and has 5 distinct operating areas. The building was designed with necessary safety and structural features to allow radioactive and hazardous material uses in support of research and development activities. Contains laboratories for performing chemical and process development activities.

EMISSION UNIT: EP-324-01-S 300EP-324-01-S

Emission Unit Location:

46° 22' 7.8" N
119° 16' 28" W

Major Stack: Yes

Process Description:

The following is a list of permitted processes for this emission point: Characterization of radioactive material, clean out of contaminated cells, testing and examining of irradiated fuel and molecular sieve bed and instrument bed tree packaging, cesium legacy safety program, defense material examination and management, surveillance and maintenance, waste management, including treatment of high and low level waste streams, radiochemical engineering, melter development and demonstration, and facility deactivation activities, consisting of the removal, reduction and stabilization of the radioactive and chemical materials remaining in the building.

Stack Height: 158.8 ft. 48.40 m

Stack Diameter: 8.0 ft. 2.44 m

Average Stack Effluent Temperature: 77 degrees farenheit 23.5 degrees Celsius

ExhaustVelocity: 23 ft/second 23.0 m/second

Average Volumetric Flow Rate: 1160 cfm 32.7 cubic meters/sec

Controls:

All operations in the B Cell will operate with an electro static precipitator, a non testable HEPA filter and one testable HEPA filter prior to the final stage of HEPA filters. All other areas in the building will operate with either a series of two testable HEPA filters or one testable HEPA filter prior to the final stage of testable HEPA filters.

TECHNICAL SUPPORT DOCUMENT

BUILDING 325 APPLIED CHEMICAL LAB

Building Description:

A rectangular welded metal fram structure with insulated metal siding erected on reinforced concrete footings , walls and slabs. The building houses hot cells and laboratory hoods used in research and development activities.

EMISSION UNIT: EP-325-01-S 300EP-325-01-S

Emission Unit Location:

46° 22' 7.1" N
119° 16' 44" W

Major Stack: Yes

Process Description:

The following are permitted activities and or processes: Radiochemistry, radio-analytical services, radiochemical process development, mixed waste treatment activities, waste tank characterization, medical isotope production, research and development activities involving radioactive material, including waste disposal, plutonium chemistry, tank safety investigations, and nuclear fuel characterization.

Stack Height: 88.8 ft. 27.07 m

Stack Diameter: 8.0 ft. 2.44 m

Average Stack Effluent Temperature: 79 degrees farenheit 24.1 degrees Celsius

ExhaustVelocity: 45 ft/second 45.2 m/second

Average Volumetric Flow Rate: 2270 cfm 64.3 cubic meters/sec

Controls:

The 325 Building Hot Cell, Change Room, and Hoods exhaust by a single line through two HEPA filters in series. The 325 Building Air Lock, Hot Cell, Storage Cell, and Hoods exhaust by a single line through a single HEPA filter. These two lines combine and exhaust through four parallel banks of single HEPA filters, and then though four parallel lines made up of an air control device, a fan, an another air control device prior to exit out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 326 MATERIAL SCIENCE LAB

Building Description:

Contains labs and equipment for studies of metallurgical, chemical and physical behavior of fuels and Rx components.

EMISSION UNIT: EP-326-01-S 300EP-326-01-S

Emission Unit Location:

46° 22' 9.3" N
119° 16' 42" W

Major Stack: No

Process Description:

This building focuses on research and development relating to: mechanical testing of metallic and composite materials, electron microscope, sample preparation and the examination and preparation of sample material for x-ray detraction.

Stack Height: 47.7 ft. 14.54 m

Stack Diameter: 6.0 ft. 1.83 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 31 ft/second 31.4 m/second

Average Volumetric Flow Rate: 888 cfm 25.1 cubic meters/sec

Controls:

The 326 Building Hoods and SEM areas exhaust by a single line through two testable HEPA filters. The 326 Building Hot Cells, Gloveboxes, and Hoods exhaust by a sing line through a one testable HEPA filter. Both lines join to form a common line, which splits into three parallel lines made up of an inlet damper, a fan, and an outlet damper. The three parallel lines rejoin and exhaust out a single stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 327 BUILDING

Building Description:

A 25,200 sq foot single store multi use building with a partial basement. Laboratories occupy approximately 10,000 square feet. The supply ventilation units are located in the basement, the west end of the canyon in the transfer and storage area and the northwest storage area of the canyon.

EMISSION UNIT: EP-327-01-S 300EP-327-01-S

Emission Unit Location:

46° 22' 12" N
119° 16' 41" W

Major Stack: Yes

Process Description:

This emission unit is permitted for the following activities: supporting medical isotope recovery, N fuel characterization, Waste Encapsulation Storage Facility(WESF) capsule storage, surveillance decontamination of waste tank sampling equipment, supporting Fast Flux Test Facility (FFTF) functions, and Tritium loop, capsule loop PIE and disposal, and facility deactivation activities, consisting of the removal, reduction and stabilization of the radioactive and chemical materials remaining in the building.

Stack Height: 44.9 ft. 13.69 m

Stack Diameter: 5.0 ft. 1.52 m

Average Stack Effluent Temperature: 75 degrees farenheit 22.9 degrees Celsius

ExhaustVelocity: 42 ft/second 42.0 m/second

Average Volumetric Flow Rate: 825 cfm 23.4 cubic meters/sec

Controls:

The 327 facility main exhaust includes the cold exhaust and the hot exhaust systems. The cold exhaust system takes potentially contaminated air and filters it through one stage of HEPA filters before the air released out the stack. The hot exhaust system takes air from all high contamination areas such as shielded cells, and filters it through two stages of HEPA filters before the air is released out the stack. A charcoal filter is available and can be valved in or out as required by the facility safety Analysis

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: EP-327-02-V 300EP-327-02-V

Emission Unit Location:

46° 22' 12" N
119° 16' 41" W

Major Stack: No

Process Description:

This emission unit is permitted for the following activities: supporting medical isotope recovery, N fuel characterization, Waste Encapsulation Storage Facility(WESF) capsule storage, surveillance decontamination of waste tank sampling equipment, supporting Fast Flux Test Facility (FFTF) functions, and Tritium loop, capsule loop PIE and disposal, and facility deactivation activities, consisting of the removal, reduction and stabilization of the radioactive and chemical materials remaining in the building.

Stack Height: 29.9 ft. 9.11 m

Stack Diameter: 0.3 ft. 0.09 m

Average Stack Effluent Temperature: 75 degrees farenheit 22.9 degrees Celsius

ExhaustVelocity: 14 ft/second 14.0 m/second

Average Volumetric Flow Rate: 0.99 cfm 0.0 cubic meters/sec

Controls:

The 327 Building's main exhaust system (Decon Cell) exits by a single line through a HEPA filter and then connects with the exhaust from the Compactor. After this the exhaust enters another HEPA, exiting through a inlet damper and fan before entering the stack. The compactor exhausts through a single line containing a damper, HEPA filter and damper. After the last damper, the compactor line then connects and joins the Decon cell exhaust between its previously mentioned HEPA filters.

TECHNICAL SUPPORT DOCUMENT

BUILDING 329 BUILDING

Building Description:

A two story 39,400 sq foot building. The lower level houses the radio-chemistry and analytical chemistry laboratory. The neutron multiplier and associated office space are located on the first floor.

EMISSION UNIT: EP-329-01-S 300EP-329-01-S

Emission Unit Location:

46° 22' 8" N
119° 16' 46" W

Major Stack: No

Process Description:

This facility conducts measurements and procedure development in support of the Hanford Site environmental restoration and waste management activities. These activities include environmental samples of soils, waters' vegetation, decommissioning materials, and samples of high level tank waste analyzed for all radionuclides and hazardous constituents. Advanced analytical procedures are developed, tested and applied in this facility. This facility also conducts research and development activities in the nuclear sciences, with emphasis in radiation instrumentation development and applications, low-level radioactive waste characterization and management, radiological decommissioning, environmental radioactivity measurements, radiochemical separations and measurements, and basic nuclear chemistry and physics.

Stack Height: 62.5 ft. 19.05 m

Stack Diameter: 5.0 ft. 1.52 m

Average Stack Effluent Temperature: 72 degrees farenheit 21.9 degrees Celsius

ExhaustVelocity: 38 ft/second 38.4 m/second

Average Volumetric Flow Rate: 754 cfm 21.4 cubic meters/sec

Controls:

The 329 Building Hood/Room 16C-1, and Neutron Multiplying Facility exhaust by a single line before joining the exhaust from the 329 Building Hoods. The line then exhausts through 5 parallel banks of double HEPA filters. The line then exits through three parallel lines consisting of an inlet damper, fan and outlet damper prior to the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 331 LIFE SCI LAB

Building Description:

Building contains facilities for biological and ecological research studies.

EMISSION UNIT: EP-331-01-V 300EP-331-01-V

Emission Unit Location:

46° 22' " N
119° 16' " W

Major Stack: Yes

Process Description:

The emission unit supports a research facility, working with the health effects of hazardous materials in soils, plants, microorganisms and solutions.

Stack Height: 62.0 ft. 18.90 m

Stack Diameter: 6.5 ft. 1.98 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 36 ft/second 35.8 m/second

Average Volumetric Flow Rate: 1190 cfm 33.6 cubic meters/sec

Controls:

All areas serviced by this emission unit will operate with one or two testable HEPA filters, in accordance with the AOP schematics.. The emission unit will also operate with actuated dampers and fans.

TECHNICAL SUPPORT DOCUMENT

BUILDING 331G building

Building Description:

The main building is a 3-story, reinforced concrete structure consisting of 2 laboratory floors with a mechanical elictrical services floor in between. The main floor contains laboratories in support of research on health effects of chemicals and radiation. The ventilation supply and exhaust equipment, mechanical and elictrical services are located on the 2nd floor. The 3rd floor contains additional laboratory functions such as animal physiology and inhalation toxicology, virology, and histology laboratories, and glass ware washing facilities.

EMISSION UNIT: EP-331G-02-S 300EP-331G-02-S

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

The building provides research capabilities for conducting radioactive tracer studies using animals, biota, vegitation and soils. Small quantities of tracer radionuclides are deposited in soil, taken up by vegitation and fed to small animals. The animals are temmporarily housed in the facility, and their excrements are stored in closed containers within the facility. Attachmetn 3 contains the detailed radionuclide inventory.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: EP-331G-01-S 300EP-331G-01-S

Emission Unit Location:

o ' " N

o ' " W

Major Stack: No

Process Description:

The building provides research capabilities for conducting radioactive tracer studies using animals, biota, vegitation and soils. Small quantities of tracer radionuclides are deposited in soil, taken up by vegitation and fed to small animals. The animals are temmporarily housed in the facility, and their excrements are stored in closed containers within the facility. Attachmetn 3 contains the detailed radionuclide inventory.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING 340 BUILDING

Building Description:

Concrete building structure with research and development activities. This building also houses radioactive liquid waste in six above ground storage tanks.

EMISSION UNIT: 340-NT-EX 300P-340NTEX-001

Emission Unit Location:

46° 22' 11" N
119° 16' 34" W

Major Stack: Yes

Process Description:

Exhausts 340 building vault and waste tanks.

Stack Height: 18.0 ft. 5.49 m

Stack Diameter: 1.6 ft. 0.49 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 17 ft/second 16.6 m/second

Average Volumetric Flow Rate: 33.4 cfm 0.9 cubic meters/sec

Controls:

The 340 A AGS Tanks and 340 Tank Vault Building are exhausted by this system. 340 A AGS vents into 340 Tank Vault Building. The 340 Tank Vault Building then exhausts through a damper, a pre-filter, HEPA filter, two parallel trains of HEPA filters, a charcoal filter, and a damper. It then splits into two identical/parallel exhaust lines. Each side consists of a fan and damper. After the dampers, the lines rejoin into one, traveling out the stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 340 Decon 300P-340DECON-001

Emission Unit Location:
46° 22' 11" N
119° 16' 34" W

Major Stack: No

Process Description:

This stack exhausts air from the 340 facility truck lock, operator's office, change rooms, decontamination area, and sampling hood.

Stack Height: 9.8 ft. 3.00 m

Stack Diameter: 2.5 ft. 0.76 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 26 ft/second 25.5 m/second

Average Volumetric Flow Rate: 125 cfm 3.5 cubic meters/sec

Controls:

Four areas are exhausted by this stack. They are as follows: Work Area Vent, Hood,Sump & Decon. All three areas vent into a single line. This single line is then split into three identical/parallel lines. Each line contains a damper, HEPA filter and damper. All three lines reconnect into a single line which then connects to an exhaust line from the Decon Area Change Rooms. After this the line continues on through two HEPA's and one fan before traveling out the stack. The Sump area is filtered through a , before it vents/travels into the first single exhaust line.

EMISSION UNIT: 340-B-BLDG 300P-340BBLDG-001

Emission Unit Location:
46° 22' 12" N
119° 16' 21" W

Major Stack: No

Process Description:

This stack exhausts filtered air from the 340 B East building. The stack exhaust system operates when railway cars are housed within the facility.

Stack Height: ft. m

Stack Diameter: 1.5 ft. 0.46 m

Average Stack Effluent Temperature: 70 degrees farenheit 21.3 degrees Celsius

ExhaustVelocity: 17 ft/second 16.5 m/second

Average Volumetric Flow Rate: 29.2 cfm 0.8 cubic meters/sec

Controls:

This emission unit exhausts the B East Building Operations. It travels through an air intake louver and then splits into two exhaust systems. These two parallel exhaust systems are each made up of a damper, HEPA filter, and damper. The systems rejoin, traveling through an exhaust fan to the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 3720 BUILDING

Building Description:

Built in 1959 on the northern end of the 300 area. The 24,412 sq foot building is an all metal frame construction erected fouondations, footings and floor slab. This building also contains a 24x109 foot basement in the southwest corner. In 1980 a one story annex building was added onto the north end of the building. Contains low-level radiochemistry laboratories and a counting room.

EMISSION UNIT: EP-3720-01-S 300EP-3720-01-S

Emission Unit Location:

46° 22' 23" N
119° 16' 45" W

Major Stack: Yes

Process Description:

This building conducts basic and applied research for support to sponsors. Research activities performed in this facility include: delineating the fundamental processes and mechanisms that influence the behavior of metals and radionuclides of environmental concern in the subsurface environment, evaluating waste form stability and the ability of various materials (e.g., grout, glasses, cements) to immobilize contaminants of concern, and preparing and testing/analyzing materials and samples. Other areas of research include leaching dissolution and thermodynamic experiments, collecting thermodynamic data for glass dissolution and thermodynamic and solubility data for actinides in brines, evaluation of inorganic ion exchangers, and evaluating the solubility of selected elements in decontamination and decommissioning slags.

Stack Height: 36.1 ft. 11.00 m

Stack Diameter: 4.0 ft. 1.22 m

Average Stack Effluent Temperature: 77 degrees farenheit 23.5 degrees Celsius

ExhaustVelocity: 29 ft/second 29.3 m/second

Average Volumetric Flow Rate: 368 cfm 10.4 cubic meters/sec

Controls:

The two areas serviced by this stack must pass through two valves, two banks of HEPA filters and then two dampers then through two fans and then through two more dampers prior to reaching the sampling point.

TECHNICAL SUPPORT DOCUMENT

BUILDING 3730 GAMMA IRRAD FAC

Building Description:

A one story 4000 sq foot concrete block structure. Contains a hot cell for metallurgical and chemical studies of irradiated and non-irradiated materials.

EMISSION UNIT: EP-3730-01-S 300EP-3730-01-S

Emission Unit Location:

o ' " N

o ' " W

Major Stack: No

Process Description:

Exhausts building air.

Stack Height: 19.3 ft. 5.88 m

Stack Diameter: 0.7 ft. 0.20 m

Average Stack Effluent Temperature: 85 degrees farenheit 25.9 degrees Celsius

ExhaustVelocity: 17 ft/second 16.7 m/second

Average Volumetric Flow Rate: 5.89 cfm 0.2 cubic meters/sec

Controls:

The 3730 building cells exhaust by a single line through two HEPA filters and a fan prior to exit out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING 437 Maintenance and Storage (MASF)

Building Description:

A multipurpose service center that supports the specialized maintenance and storage requirements of the 400 area facilities. The facility provides the capacity for decontamination, repair and storage.

EMISSION UNIT: 437-MN&ST 400P-437MN&ST-001

Emission Unit Location:

46° 26' 16" N
119° 21' 39" W

Major Stack: No

Process Description:

This building stores, decontaminates and repairs radiologically contaminated equipment.

Stack Height: 2.7 ft. 0.84 m

Stack Diameter: 8.0 ft. 2.44 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 5 ft/second 4.9 m/second

Average Volumetric Flow Rate: 246 cfm 7.0 cubic meters/sec

Controls:

The decontamination room (Decon 1 & 2 in the MN&ST) is connected directly to the main exhaust system for the MN&ST building. The exhaust system for the decon 1&2 starts out with two automatic dampers, two parallel banks of three HEPA filters with a manual damper in between each filter. After the last manual damper the exhaust splits three ways. Two of the runs contain an exhaust fan and an automatic damper. The third exhaust run contains an automatic damper which allows the system to bypass the other two runs. All three of these exhaust runs connect to a common plenum which travels out the stack.

The Shipping Cask Maintenance and Decon glove box in building 437 connects to the Decontamination Room at a junction between the first and second auto dampers described in the second sentence of the previous paragraph. This exhaust run contains a damper and a single HEPA filter.

The Waste Tank 1 & 2 Vents is exhausted through a damper and then connects at a junction similar to the Shipping Cask Maintenance and Decon Glove Box connection (described in the second sentence of the first paragraph).

Two totally redundant systems describe the Radiological Waste Tank Room Ventilation and Liquid Radioactive Waste Loadout Facility Ventilation systems. They (each) consist of a manual damper, HEPA pre-filter, damper, HEPA filter and finally a manual discharge damper. These two systems reconnect to the Decon 1 & 2 exhaust line, just below the first runs last manual damper and just above the Decon 1 & 2's three final exhaust runs.

The last room exhausted to this stack is called the Contaminated Equipment Repair Station. It consists of a pre-filter, damper, two parallel HEPA filters, another damper and then connects below the previous two systems (Liquid Radioactive Waste Facility and Radiological Waste Tank Room) and just above the Decon 1 & 2 facilities main exhaust line.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 437-1-61 400P-437-002

Emission Unit Location:
46° 26' 16" N
119° 21' 39" W

Major Stack: No

Process Description:

This building stores decontaminates and repairs radiologically contaminated equipment.

Stack Height: 4.0 ft. 1.22 m

Stack Diameter: 6.0 ft. 1.83 m

Average Stack Effluent Temperature: 72 degrees farenheit 21.9 degrees Celsius

ExhaustVelocity: 19 ft/second 18.8 m/second

Average Volumetric Flow Rate: 530 cfm 15.0 cubic meters/sec

Controls:

Building 437 process operations exhaust system has a design which splits into two identical /parallel systems. Each side consists of a damper, pre-filter, damper, 8 parallel HEPA filters and a damper. Both systems then merge into a common line which is exhausted through a fan and then out the stack. In between the fan and stack is a recycle air circulation line reconnecting the exhaust system to the building. This is done for building temperature control.

TECHNICAL SUPPORT DOCUMENT

BUILDING CANNISTER STORAGE BLDG (CSB)

Building Description:

EMISSION UNIT: CSB 200ECanister Storage Bldg

Emission Unit Location:

o ' " N

o ' " W

Major Stack: Yes

Process Description:

200E

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING Central Wste Complex

Building Description:

The central waste complex stores radioactive and mixed drums and containers. This storage facility is ment for interim storage. The Central Waste Complex also stores drums in several trenches known as burrial grounds. The burrial grounds may or maynot be covered with dirt.

EMISSION UNIT: Central Waste Complex 200WCWC

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

200W

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING COLD VACUUM DRY SYSTEM BLDG (CVS)

Building Description:

EMISSION UNIT: Cold Vacuum Drying 100KCold Vac. Drying

Emission Unit Location:

46° 38' 42" N
119° 36' 19" W

Major Stack: Yes

Process Description:
100K

Stack Height: 15.0 ft. 4.57 m

Stack Diameter: 0.8 ft. 0.23 m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING Effluent Treatment Facility(ETF)

Building Description:

A relatively new building completed in the mid 1990's for the treatment of effluent radioactive waste. The building is made of pre-fabrication metal with a concrete slab floor.

EMISSION UNIT: 296-E-1 200EP-2025E ETF

Emission Unit Location:

46° 34' 1.4" N
119° 30' 38" W

Major Stack: No

Process Description:

A single waste treatment train with course suspend solids removal, uv-oxidation with hydrogen peroxide, pH adjustment and fine suspended solid removal.

Stack Height: 51.0 ft. 15.54 m

Stack Diameter: 6.0 ft. 1.83 m

Average Stack Effluent Temperature: 85 degrees farenheit 25.9 degrees Celsius

ExhaustVelocity: ,7,000 ft/second ',000.0 m/second

Average Volumetric Flow Rate: 2E+06 cfm 5,636 cubic meters/sec

Controls:

The vapor off gas system passes through a damper, demister, prefilter, a single HEPA filter, a charcoal filter and then one more single stage HEPA filter before the damper and fans. After the two parallel fans, the vessel off gas enters the building exhaust, which consists of two parallel exhaust trains, each with a series of dampers, a 5X4 prefilter array, and a 5X4 HEPA filter array, prior to the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING EMSL

Building Description:

Environmental & Molecular Sciences Lab. Will provide experimental & computational capabilities designed for R & D activities to solve environmental restoration & waste mgt problems.

EMISSION UNIT: EP-3020-01-S 300EP-3020-01-S

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

Operations are divided into seven programmatic areas: Environmental Dynamics and Simulation; Chemical Structure and Dynamics; Materials and Interfaces, including sensor development; Macromolecular Structure and Dynamics; Advanced Processing; Theory Modeling and Simulation; and Computer and Information Sciences.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

A stack assessment will be performed when the facility becomes operational. The filtration will be with a HEPA.

TECHNICAL SUPPORT DOCUMENT

BUILDING FAST FLUX TEST FACILITY COMPLEX

Building Description:

This building contains a shutdown fast breeder reactor, containment vessel with hot cells and attached and detached auxiliary buildings. The reactor is a 400 MW thermal, sodium-cooled, low-pressure, high-temp reactor plant. The facility is maintained in a radiological safe shutdown condition.

EMISSION UNIT: FFTF-HT-TR 400P-FFTFHTTR-001

Emission Unit Location:

46° 26' 6.0" N
119° 21' 36" W

Major Stack: No

Process Description:

Heat transport system south. Exhausts normally unfiltered air from FFTF areas exterior to the containment. This facility has been de-fueled. It still contains and stores radiological contaminated equipment

Stack Height: 2.0 ft. 0.61 m

Stack Diameter: 3.9 ft. 1.19 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 17 ft/second 17.4 m/second

Average Volumetric Flow Rate: 208 cfm 5.9 cubic meters/sec

Controls:

Beginning at building 491-S, the air effluent/exhaust has two potential air pathways within the air handling system. One side consists of an automatic damper. This automatic damper activates when the other sides first in line damper is closed. On the other side there is an automatic damper, pre-filter, HEPA filter, fan and damper. Both systems then merge into a single line which then splits into two redundant/parallel lines each containing a fan and damper. Both systems then merge again to travel/exhaust out the stack. On detection of radiation the exhaust is automatically diverted through the HEPA filtered system.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: FFTF-402-1 400Sodium Storage Facility

Emission Unit Location:

o ' " N

o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: FFTF-CB-EX 400P-FFTFCBEX-001

Emission Unit Location:

46° 26' 8.4" N
119° 21' 36" W

Major Stack: No

Process Description:

This facility was de-fueled. The building houses contaminated equipment. Stack is square (4 x 2.5 ft) with virtual radius of 3.6.

Stack Height: 4.5 ft. 1.37 m

Stack Diameter: 3.6 ft. 1.10 m

Average Stack Effluent Temperature: 70 degrees farenheit 21.3 degrees Celsius

ExhaustVelocity: 20 ft/second 19.8 m/second

Average Volumetric Flow Rate: 202 cfm 5.7 cubic meters/sec

Controls:

The FFTF does not rely on on-line filtration systems as the primary means for removal of radionuclides from the plant exhaust. This system uses surge and delay tanks and cryogenic units as the primary method to remove radionuclides form the gas being processed. The HEPA filters are on standby and must be valved in or automatically redirected upon exposure to high radiation levels. There are three main air effluent exhaust systems. There are three main air effluent exhaust systems. The Argon Processing and Cell Atmosphere Processing system, the building 405 system (the Reactor Containment Building), and the Access Control Area Process Operations.
The building 405 system is the main exhaust path with the other two systems feeding into this exhaust path. Building 405's exhaust goes out a single exhaust line through a damper and then splits into two exhaust runs. One run contains a prefilter, HEPA filter bank, damper, exhaust fan and damper. The other side contains two dampers in a row, an exhaust fan and then another damper. The flow can be diverted through its standby prefilter/HEPA filter bank as discussed above. Building 405's exhaust reconnects and then travels out the stack.

The Argon Processing system is nothing more than an inline damper connected to the stack.

The Access Control Area Process flow is made up of two exhaust runs. One side is made up of a damper, exhaust fan and damper. The other side has a damper, pre-filter, HEPA bank, fan, damper, fan and damper. Both exhaust runs connect into a single line (after the last set of dampers) and then reconnects into the main exhaust line (building 405's) just below the last dampers and just ahead of the stack. Upon detection of radiation, the Access Control Area exhaust is automatically diverted through its standby HEPA filter bank as described above.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: FFTF-RE-SB 400P-FFTFRESB-001

Emission Unit Location:

46° 26' 8.4" N
119° 21' 34" W

Major Stack: No

Process Description:

Exhausts unfiltered air from lower level of the Reactor Service Building. This facility has been de-fueled and stores radiological contaminated equipment.

Stack Height: 19.0 ft. 5.79 m

Stack Diameter: 3.0 ft. 0.91 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 14 ft/second 13.5 m/second

Average Volumetric Flow Rate: 95.4 cfm 2.7 cubic meters/sec

Controls:

Beginning at building 4717, the air effluent passes through a damper, then travels to an exhaust fan where it is exhausted out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING GUZZLER

Building Description:

The Guzzler is a completely self-contained positive displacement type vacuum pump with a hydraulic pneumatic control system, multiple air filtration systems and a dump type hydraulically sealed payload collection tank.

EMISSION UNIT: Guzzler use on the Hanford Sit Hanford SitewideW-PORTEX 021

Emission Unit Location:

o ' " N
o ' " W

Major Stack: No

Process Description:

Site

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING Liquid Effluent Retention Facility (LERF)

Building Description:

This facility consists of three lined trenches with a low density polyethylene membrane underneath and over the liquid waste. These basins have passive vents.

EMISSION UNIT: LERF Basin #43 200EP-242AL43-001

Emission Unit Location:

46° 33' 48" N
119° 31' 0.6" W

Major Stack: No

Process Description:

CENTER trench

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

The lined trenches are required to have covers at all time. The liners are reuquired controls, insuring limited airborne emissions.

EMISSION UNIT: LERF Basin #42 200EP-242AL42-001

Emission Unit Location:

46° 33' 48" N
119° 31' 0.6" W

Major Stack: No

Process Description:

WEST trench

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

The lined trenches are required to have covers at all time. The liners are reuquired controls, insuring limited airborne emissions.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: LERF Basin #44 200EP-242AL44-001

Emission Unit Location:

46° 33' 48" N
119° 31' 0.6" W

Major Stack: No

Process Description:

EAST trench

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

The lined trenches are required to have covers at all time. The liners are reuquired controls, insuring limited airborne emissions.

TECHNICAL SUPPORT DOCUMENT

BUILDING PLUTONIUM FINISHING PLANT(Z PLANT)

Building Description:

The Plutonium Finishing complex consists of one main building and several annexes. The complex was constructed to produce plutonium metal from recovered nitrate and plutonium nitrate from plutonium scrap.

EMISSION UNIT: 296-Z-15 200WP-296Z015-001

Emission Unit Location:

46° 32' 60" N
119° 37' 58" W

Major Stack: No

Process Description:

This stack exhausts filtered air from the 243-Z low level waste Treatment facility. Emmissions moniotring consists of a record sampler

Stack Height: 42.0 ft. 12.80 m

Stack Diameter: 1.0 ft. 0.30 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 34 ft/second 34.0 m/second

Average Volumetric Flow Rate: 26.7 cfm 0.8 cubic meters/sec

Controls:

The ventilation system originates at the 243-Z building. It flows through a prefilter to a single stage HEPA. Exhausts though a damper and fan before exiting the stack.

EMISSION UNIT: 296-Z-6 200WP-296Z006-001

Emission Unit Location:

46° 33' 0.9" N
119° 38' 1" W

Major Stack: No

Process Description:

It vents the 2736-Z Building. The 2736-Z building provides Special Nuclear Materials storage and surveillance activities.

Stack Height: 2.5 ft. 0.76 m

Stack Diameter: 2.5 ft. 0.76 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 36 ft/second 36.4 m/second

Average Volumetric Flow Rate: 179 cfm 5.1 cubic meters/sec

Controls:

The ventilation system originates at the 2736-Z building. The exhaust path exits the building and splits into two parallel paths. Each contain a total of three banks of 2-stage filters, passes though a damper and fan. The lines are rejoined before exiting the stack

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 291-Z-1 200WP-291Z001-001

Emission Unit Location:

46° 32' 59" N
119° 37' 59" W

Major Stack: Yes

Process Description:

This stack vents the 242-Z, 236-Z, and 234-5Z buildings. The 242-Z used to recover plutonium and americium in low level liquid waste. Currently it is locked out and awaiting final decontamination. The 236-Z operations include surveillance activities of stored unstable Pu scrap materials in process gloveboxes and cleanout activities of some process gloveboxes. 234-5Z current operations include sludge stabilization activities in glovebox HC-21C, downloading and testing of corrosive Pu bearing liquid in the PPSL, laboratory operations at the Analytical Laboratory, surveillance activities of unstable Pu material, solid waste handling operations, low-level Waste Treatment Facility operation. Additional stabilization and cleanout activities are ongoing.

Stack Height: 200.0 ft. 60.96 m

Stack Diameter: 13.5 ft. 4.11 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 34 ft/second 33.8 m/second

Average Volumetric Flow Rate: 4840 cfm 137.0 cubic meters/sec

Controls:

The ventilation system originates in 242-Z, 236-Z, and 234-5Z facilities. The system consists of three parallel lines originating from each building. Buildings 236-Z and 242-Z have two stage HEPA's. The line from the 234-5Z passes through a single stage HEPA. It then splits into 2 lines containing a damper and a single stage HEPA. All lines rejoin and flow through the 291-Z Exhaust fan building. There are seven electric fans (4 electric and 3 standby) and 2 steam turbines. The exhaust then goes up the stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-Z-3 200WP-296Z003-001

Emission Unit Location:

46° 32' 58" N
119° 37' 58" W

Major Stack: No

Process Description:

This stack vents the 241-Z, 241-ZA, and 241-ZB buildings. These buildings constitute the Waste Treatment Facility that receives waste only from the PFP complex. Once the waste stream is treated it is then transferred to the tank farms

Stack Height: 25.0 ft. 7.62 m

Stack Diameter: 1.2 ft. 0.37 m

Average Stack Effluent Temperature: 49 degrees farenheit 14.9 degrees Celsius

ExhaustVelocity: 14 ft/second 13.5 m/second

Average Volumetric Flow Rate: 15.3 cfm 0.4 cubic meters/sec

Controls:

The ventilation system originates at the 241-Z, 241-ZA, buildings. The system first passes through a demister and the a heater. It is divided into two parallel lines. Each line has a prefilter followed by 2-stage of HEPA filtration. The two lines rejoin. The exhaust path splits again then flows though a damper and fans and set in parallel. The lines are rejoined before exiting the stack.

EMISSION UNIT: 296-Z-5 200WP-296Z005-001

Emission Unit Location:

46° 33' 0.3" N
119° 38' 1.4" W

Major Stack: No

Process Description:

Exhausts filtered air from the shipping and receiving building, 2736-ZB.

Stack Height: 27.9 ft. 8.50 m

Stack Diameter: 2.0 ft. 0.61 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 37 ft/second 36.5 m/second

Average Volumetric Flow Rate: 115 cfm 3.2 cubic meters/sec

Controls:

The ventilation system originates at the 2736-ZB building. A HEPA filter is on the hoods and a primary non-testable glove box filter. The system contains two parallel 2-stage HEPA filters of 4 banks each. The flow continues through a damper and exhausts and 2 fans on each leg before rejoining and exiting the stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-Z-14 200WP-296Z014-001

Emission Unit Location:

46° 32' 59" N
119° 38' 0.2" W

Major Stack: No

Process Description:

This building ventilates through the 232-Z building. The 232-Z building is in the process of removing plutonium from the duct work, process gloveboxes and other deactivation activities.

Stack Height: 21.0 ft. 6.40 m

Stack Diameter: 1.0 ft. 0.30 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 27 ft/second 27.3 m/second

Average Volumetric Flow Rate: 21.4 cfm 0.6 cubic meters/sec

Controls:

The ventilation system originates in the 232-Z building. The system exits the building and is divided into three parallel lines. Each line has 2-stages of HEPA filtration. The three lines rejoin. The exhausts then flows though two fans and dampers. The lines are rejoined before exiting the stack

EMISSION UNIT: 296-Z-10

Emission Unit Location:

46° 32' Ξ+03" N
119° 37' Ξ+03" W

Major Stack: No

Process Description:

Not expected to operate from 8/15/91 to 8/15/93. Requesting reregisteration.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-Z-7 200W200W P-296Z007 001

Emission Unit Location:

46° 33' 0" N
119° 37' 60" W

Major Stack: Yes

Process Description:

This stack will by used to ventilate the stablization and or repacking of plutonium and uranium, oxide and metals for long term storage.

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: 1,800 ft/second .,800.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

The stack will have two stages of HEPA filtration with a minimun efficiency 99.95 percent for particles with a medium diameter of 0.3 microns. The stack monitoring system will consist 2 shrouded probes located in the stack exhaust stream within the stack at an elevation of approximately 25 feet. Each probe will have a separate sample line to deliver a sample stream to the stack monitoring equipment lacated at the base of the stack. Fail and high radiation alarms will be provided on the alpha monitor. Sample pumps located downstream fronm the alpha monitor and record sampler. A sample line will be provided for DOH so co-sampling can occur when requested by DOH.

TECHNICAL SUPPORT DOCUMENT

BUILDING PUREX

Building Description:

Plutonium-Uranium Extraction Plant was built for fuel reprocessing. The main building 202A is a heavily shielded concrete structure known as the canyon building. Auxiliary PUREX equipment are located either outdoors or in one of the several out buildings.

EMISSION UNIT: 291-A-1 200EP-291A001-001

Emission Unit Location:

46° 32' 56" N
119° 31' 8.6" W

Major Stack: Yes

Process Description:

Main stack. Exhaust from canyon (cells A to M), vessel and condenser vents, and the dissolver offgas system.PUREX has transitioned to a shutdown operation. This placed the building in a safe and environmentally secure configuration

Stack Height: 200.0 ft. 60.96 m

Stack Diameter: 7.0 ft. 2.13 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 17 ft/second 17.0 m/second

Average Volumetric Flow Rate: 654 cfm 18.5 cubic meters/sec

Controls:

This emission unit exhausts from the 202-A building through a deep bed glass filter, 10 HEPA banks in parallel, each bank having two HEPAs and an inlet and outlet isolation valve, four exhaust fan in parallel, each fan having a suction and discharge damper(steam driven exhaust fan out of service), and out a stack.

EMISSION UNIT: 296-A-10 200EP-296A010-001

Emission Unit Location:

46° 32' 37" N
119° 31' 5.9" W

Major Stack: No

Process Description:

Storage Tunnel No. 2 exhaust. Listed as inactive 03/14/97, now active.

Stack Height: 6.1 ft. 1.86 m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING Radiological counting facility

Building Description:

EMISSION UNIT: RCF-2-EX 300S-RCF-EX 002

Emission Unit Location:

o ' " N

o ' " W

Major Stack: No

Process Description:

Stack Height: ft. m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING ROTARY MODE CORE SAMPLER

Building Description:

EMISSION UNIT: 296-P-34 200P-296P034-001

Emission Unit Location:

o ' " N
o ' " W

Major Stack: Yes

Process Description:

This emission point is the portable exhauster for the rotory mode core sampler. This emission source exhuast filtered air from the waste tanks being core sampled.

Stack Height: 4.3 ft. 1.30 m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

EMISSION UNIT: 296-P-32 200P-296P032-001

Emission Unit Location:

o ' " N
o ' " W

Major Stack: Yes

Process Description:

This emission point is the portable exhauster for the rotory mode core sampler. This emission source exhuast filtered air from the waste tanks being core sampled.

Stack Height: 4.3 ft. 1.30 m

Stack Diameter: ft. m

Average Stack Effluent Temperature: 0 degrees farenheit 0.0 degrees Celsius

ExhaustVelocity: 0 ft/second 0.0 m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-P-33 200P-296P033-001

Emission Unit Location:

46° 33' 13" N
119° 34' 54" W

Major Stack: Yes

Process Description:

This emission point is the portable exhauster for the rotory mode core sampler. This emission source exhuast filtered air from the waste tanks being core sampled.

Stack Height: 4.3 ft. 1.30 m

Stack Diameter: ft. m

Average Stack Effluent Temperature: degrees farenheit degrees Celsius

ExhaustVelocity: ft/second m/second

Average Volumetric Flow Rate: cfm cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING S PLANT (REDOX)

Building Description:

The S Plant (REDOX) is a deactivated extraction processing facility with thick concrete walls and process cells. These process cells shielded equipment that was used to extract the plutonium from the fission products associated with irradiated fuel. REDOX is currently under the Surveillance and Maintenance program until such time that it is scheduled and budgeted for decommissioning.

EMISSION UNIT: 291-S-1 200WP-291S001-001

Emission Unit Location:

46° 32' 8.8" N
119° 37' 11" W

Major Stack: No

Process Description:

Provides storage for REDOX radiological equipment.

Stack Height: 200.0 ft. 60.96 m

Stack Diameter: 14.0 ft. 4.27 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 30 ft/second 30.3 m/second

Average Volumetric Flow Rate: 4660 cfm 132.1 cubic meters/sec

Controls:

The air from the 202-S canyon exhausts through a sand filter and 2 fans in parallel and vents out the 291-S-1 Stack.

EMISSION UNIT: 296-S-2 200WP-296S002-001

Emission Unit Location:

46° 32' 7.7" N
119° 37' 16" W

Major Stack: No

Process Description:

The facility is presently used as a chemical and radioactive confinement area for storage of the equipment and miscellaneous chemicals, lubricants, and decontaminating agents used in the REDOX process.

Stack Height: 50.0 ft. 15.24 m

Stack Diameter: 1.2 ft. 0.36 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 9 ft/second 9.3 m/second

Average Volumetric Flow Rate: 9.95 cfm 0.3 cubic meters/sec

Controls:

The north and south sample galleries and the PR cage areas exhaust air through a prefilter, a HEPA filter in parallel and then through a fan and out the 296-S-2 Stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING Solid Waste Management Facilities (TRUSAF)

Building Description:

This complex consists of the Central Waste Complex, the 224-T Building, caissons, and the low-level burial grounds. The central waste complex is a cluster of storage structures storing vented and sealed containers. The 224-T building is a multi-story concrete structure divided into two sections. One section is capable of storing vented and sealed containers. The other section contains the process cells that were used for chemical processing for purifying liquid plutonium nitrate by the lanthanum fluoride process. These process cells ceased operation in 1956 and have not been accessed since 1975.

TRUSAF (224) Ventilation Description:
This emission unit does not operate continually. When this emission unit is not being actively ventilated (fans are operational), air is drawn from portions of the TRUSAF facility through the 221-T facility and exhausted from the 291-T-1 (200W P-291T001-1) stack. The 296-T-12 stack passively ventilates other areas of TRUSAF when the fans are not operational.

EMISSION UNIT: 296-T-11 200WP-296T011-001

Emission Unit Location:
46° 33' 35" N
119° 37' 8.4" W

Major Stack: No

Process Description:

The process associated with this emission unit is the storage of waste drums and non destructive assay, and characterization of drums using x ray machines

Stack Height: 42.0 ft. 12.80 m

Stack Diameter: 3.0 ft. 0.91 m

Average Stack Effluent Temperature: 80 degrees farenheit 24.4 degrees Celsius

ExhaustVelocity: 44 ft/second 43.5 m/second

Average Volumetric Flow Rate: 308 cfm 8.7 cubic meters/sec

Controls:

Building 224-T process operates through a damper and a series of 3X3 HEPA filters and a fan subsequent to the sampling port.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 296-T-12 200WP-296T012-001

Emission Unit Location:

46° 33' 35" N
119° 37' 8.6" W

Major Stack: No

Process Description:

The process associated with this emission unit is the storage of waste drums and non destructive assay, and characterization of drums using x ray machines.

Stack Height: 25.0 ft. 7.62 m

Stack Diameter: 2.7 ft. 0.81 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 31 ft/second 30.8 m/second

Average Volumetric Flow Rate: 172 cfm 4.9 cubic meters/sec

Controls:

Building 224-T process operates through a damper and a series of 3X3 HEPA filters and a fan subsequent to the sampling port.

TECHNICAL SUPPORT DOCUMENT

BUILDING T PLANT COMPLEX

Building Description:

A de-activated Plutonium processing facility consisting of a large concrete building approximately 800 ft long. The inside of this facility is comprised of a canyon with thick concrete walls and approximately 20 process cells with cover blocks. These process cells used to shield process equipment designed to extract plutonium from 100 area reactor fuel rods. Last used in 1956. Currently used for decon, repair and assay of solid waste.

The 2706-T facility is a prefabricated steel building. It is used to decontaminate/treat railroad equipment, buses, trucks, automobiles, road building equipment, process equipment, and other types of equipment as requested.

The 2706-TA building is attach to the 2706-T and performs work similar to those performed with the 2706-T building.

The 2706-TB stands adjacent to the 2706-T/TA buildings for managing radioactive and mixed decontamination waste. Two stainless steel storage tanks are located in 2706-

EMISSION UNIT: 296-T-7 200WP-296T007-001

Emission Unit Location:

46° 33' 42" N
119° 37' 42" W

Major Stack: No

Process Description:

The process for this emission unit provides storage and decontamination services for highly contaminated equipment. The decontamination process includes chemical spray, abrasive immersion, and manual cleaning.

Stack Height: 25.0 ft. 7.62 m

Stack Diameter: 2.3 ft. 0.70 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 43 ft/second 42.9 m/second

Average Volumetric Flow Rate: 178 cfm 5.0 cubic meters/sec

Controls:

The exhaust systems for the 2706-T and TA buildings consist of a demister, duct heater, pre-filter, one HEPA filter, and one exhaust fan exhausting through a common stack.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 291-T-1 200WP-291T001-001

Emission Unit Location:

46° 33' 41" N
119° 37' 2.2" W

Major Stack: No

Process Description:

The process for this emission unit provides storage, treatment, sampling, repackaging, and decontamination services for highly contaminated equipment. The decontamination process includes chemical spray, abrasive immersion, and manual cleaning, sampling, treatment, storage, repacking, size reduction, etc.

Stack Height: 200.0 ft. 60.96 m

Stack Diameter: 5.0 ft. 1.52 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 31 ft/second 30.6 m/second

Average Volumetric Flow Rate: 601 cfm 17.0 cubic meters/sec

Controls:

The air exhausts from the 221-T building through a butterfly valve, one pre-filter, four banks of two stage HEPA filters with isolation butterfly valves, and two in-series exhaust fans with isolation butterfly valves.

TRUSAF (224-T) Ventilation Tie-in:
When 296-T-11 and 296-T-12 emission units are not being actively ventilated (fans are operational), air is passively drawn from portions of the TRUSAF facility through 221-T facility and exhausted form this emission unit.

TECHNICAL SUPPORT DOCUMENT

BUILDING WASTE COMPACTER

Building Description:

The waste compactor building is x feet wide, 43 feet long and consists of an entry room, a compactor rooom and a package inspection room.

EMISSION UNIT: 296-W-3 200WP-213W-001

Emission Unit Location:

46° 33' 7.9" N
119° 38' 26" W

Major Stack: No

Process Description:

The primary function or process associated with the facility is the verification of waste drums received from waste generators

Stack Height: 29.0 ft. 8.84 m

Stack Diameter: 1.3 ft. 0.41 m

Average Stack Effluent Temperature: 78 degrees farenheit 23.8 degrees Celsius

ExhaustVelocity: 16 ft/second 15.5 m/second

Average Volumetric Flow Rate: 21.6 cfm 0.6 cubic meters/sec

Controls:

The 213-building Process Operations exhaust by a single line prior to forming two parallel line. One line consists of an isolation damper, single HEPA, isolation damper, and a single HEPA. The other line consists of an isolation damper and a single HEPA. The two lines rejoin prior to splitting again into two parallel fan banks (each bank containing one fan) prior to rejoining into a single line and then exiting out the stack.

TECHNICAL SUPPORT DOCUMENT

BUILDING Waste Encapsulation and Storage Facility (WESF)

Building Description:

WESF currently provides surveillance operations to ensure safe storage and management of radiological inventory. Operations include generation of demineralized waste, and treatment and storage of radioactive waste. The facility handles waste transfers within and outside of the WESF.

EMISSION UNIT: 296-B-10 200EP-296B010-001

Emission Unit Location:

46° 33' 24" N
119° 32' 36" W

Major Stack: Yes

Process Description:

Exhausts filtered air from the WESF.

Stack Height: 75.0 ft. 22.86 m

Stack Diameter: 3.5 ft. 1.07 m

Average Stack Effluent Temperature: 68 degrees farenheit 20.7 degrees Celsius

ExhaustVelocity: 2,041 ft/second ,041.0 m/second

Average Volumetric Flow Rate: 2E+04 cfm 556.1 cubic meters/sec

Controls:

TECHNICAL SUPPORT DOCUMENT

BUILDING Waste Receiving and Processing Facility (WRAP)

Building Description:

This building is approximately 4,766 sq. meters. The building is a metal structure consisting of pre-insulated, prefinished metal, interlocking roof and wall sandwich panels.

EMISSION UNIT: 296-W-4 200WP-WRAP1 001

Emission Unit Location:

46° 33' 32" N
119° 38' 47" W

Major Stack: Yes

Process Description:

This facility will provide the capability to examine, assay, characterize, treat, repackage, and store solid radioactive and mixed waste.

Stack Height: 46.0 ft. 14.02 m

Stack Diameter: 2.6 ft. 0.79 m

Average Stack Effluent Temperature: 70 degrees farenheit 21.3 degrees Celsius

ExhaustVelocity: 373 ft/second 373.0 m/second

Average Volumetric Flow Rate: 1980 cfm 56.1 cubic meters/sec

Controls:

This facilities ventilation consists of two flow paths. One from glovebox enclosures and the other from room 107 which exits through a damper. Each of these flow paths split into to parallel paths with a damper prefilter, 2 stage HEPA a fan and another damper before all paths joining to exit the stack. As viewed, one of the HEPA banks will have an array of 4 by 4 the second will have an array of 8 by 12.

TECHNICAL SUPPORT DOCUMENT

BUILDING Waste Sampling and Characterization Facility WSCF

Building Description:

This building was constructed of prefabricated materials in a modular setting. The facility was constructed in 1995 and provides analytical services for low level radiological and non-radiological air, soil and water samples.

EMISSION UNIT: 696-W-2 600S-6266-002

Emission Unit Location:

46° 33' 24" N
119° 36' 8.6" W

Major Stack: No

Process Description:

This stack provides ventilation for the analytical instrumentation counting room. This is the secondary stack for this facility. The plenum is 1.08 ft x 3.08 ft. and the stack diameter of 2.06 is the virtual stack diameterused to calculate the volumetric flow rate.

Stack Height: 44.0 ft. 13.41 m

Stack Diameter: 2.1 ft. 0.63 m

Average Stack Effluent Temperature: 70 degrees farenheit 21.3 degrees Celsius

ExhaustVelocity: 10 ft/second 10.0 m/second

Average Volumetric Flow Rate: 33.3 cfm 0.9 cubic meters/sec

Controls:

The ventilation system exits the 6266 analytical laboratory counting room. The air flow is controlled by a fan and a damper. It divides into two legs. Each leg of this parallel system consists of a damper, a prefilter, a HEPA bank 4X3, and a damper. After the air passes through the parallel system the legs join together and pass through a fan. The air flow divided into to separate systems with 10% of the air flow exhausting directly to the stack. The other 90% recycles back into the building. This flow is regulated by a damper and a fan.

TECHNICAL SUPPORT DOCUMENT

EMISSION UNIT: 696-W-1 600S-6266-001

Emission Unit Location:

46° 33' 26" N
119° 36' 7.1" W

Major Stack: No

Process Description:

This is the main stack for this facility.

Stack Height: 42.5 ft. 12.95 m

Stack Diameter: 4.5 ft. 1.37 m

Average Stack Effluent Temperature: 70 degrees farenheit 21.3 degrees Celsius

ExhaustVelocity: 57 ft/second 57.0 m/second

Average Volumetric Flow Rate: 907 cfm 25.7 cubic meters/sec

Controls:

The ventilation exits the 6266 analytical laboratory and divides into two legs. Each leg consists of a damper, prefiltter, HEPA bank 4x3, damper and fan. Both legs feed into the stack. The sampling line is heat traced.